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THE ARCHITECT AND CONTRACT REPORTER.

A JOURNAL OF ART, CIVIL ENGINEERING & BUILDING.

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UNIVERSITY OF CALIFORNIA

THE ARCHITECTURAL ASSOCIATION.

JULY 2.—Third Summer Visit to "East Weald," Bishop's Avenue, Highgate, by kind permission of Messrs. H. V. Ashley and F. Winton Newman. Members to meet at the house (second house on the right of Bishop's Avenue from Hampstead Lane), at 3.30 p.m. Nearest stations: Hampstead Tube station, or East Finchley on the G.N.R.

JULY 6.—By order of the Council a Special General Meeting of the Architectural Association will be held on Wednesday, July 6, at 18 Tufton Street, Westminster, at 7.30 p.m., to consider the following alterations to the By-laws:—

By-law 39.—To substitute "*Monday*" for "Friday" as the day for Ordinary General Meetings.

By-law 22.—To omit the words "and committees."

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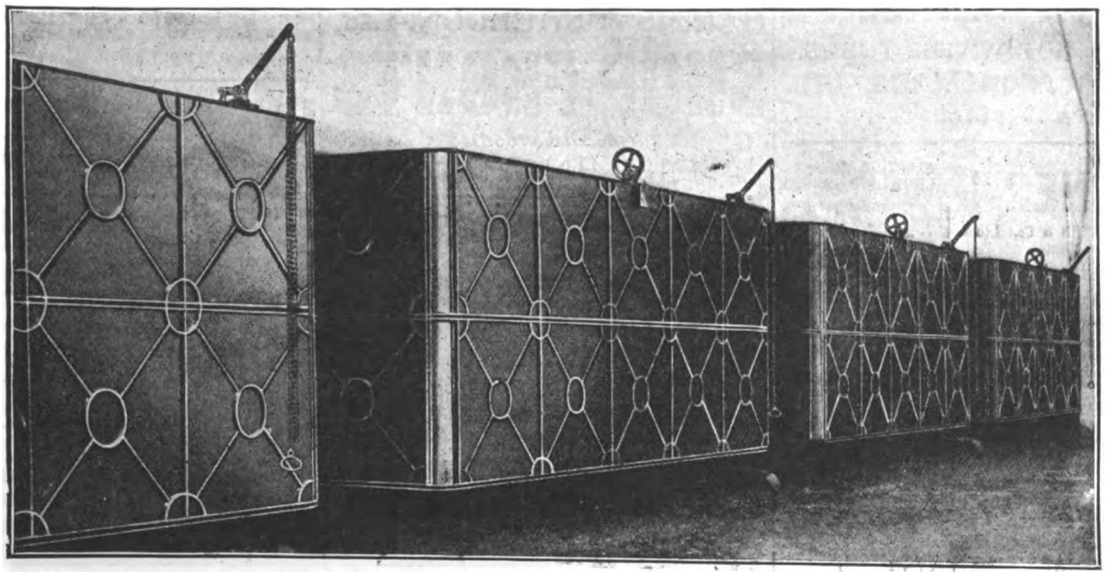
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THE ARCHITECT

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A WEEKLY

ILLUSTRATED JOURNAL

OF

ART,

CIVIL ENGINEERING.

AND

BUILDING.

Architectura est scientia pluribus disciplinis et variis eruditionibus ornata.—VITRUVIUS.

Toute la beauté d'un bâtiment s'évanouit au moment, que l'on change quelque chose d'essentiel à la symétrie—BLONDEL.

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FORTHCOMING EVENTS.

Saturday, July 2.

Architectural Association : Third Summer Visit to "East Weald," Bishop's Avenue, Highgate; by permission of Messrs. H. V. Ashley and F. Winton Newman.

Manchester Society of Architects : Visit to Shrewsbury, where the Abbey and St. Mary's Church will be visited.

Edinburgh Architectural Association : Visit to Kelso and Floors Castle.

Tuesday, July 5.

Royal Society of Antiquaries of Ireland : Summer Meeting at Douglas, Isle of Man. Closes July 8.

Architectural Association : A Special General Meeting to consider alterations to the By-laws.

Wednesday, July 6.

Royal Archæological Institute : A description of some Oriental and European Astrolabes, by Mr. Lewis Evans, F.S.A., F.R.A.S.

Thursday, July 7.

Society of Architects : Visit to Messrs. Ingham, Clark, & Co.'s Works, West Ham.

Saturday, July 9.

Guild of Architects' Assistants : Visit to Wesleyan Methodist Hall, Westminster, S.W.

TECHNICAL EDUCATION.

THE position of technical education in this country is on all sides admitted by those who know anything of the subject to be very unsatisfactory and far below the standard of that in Germany, in other continental countries, and in America. At the conference of the Association of Teachers in Technical Institutions, recently held at Birmingham, the recognition of this fact was general, and various causes were assigned for its existence.

In his presidential address Mr. J. WILSON, of the Battersea Polytechnic, mentioned some of the new industries which had come into existence during the last fifteen or twenty years—the manufacture of motor-cars, aeroplanes, metallic filament lamps, incandescent-gas mantles, machine tools, high-speed steels, synthetic indigo, calcium carbide, and artificial silk—and pointed out that in these and other inventions Germany, America, and France led the way whilst England followed, and was slowly, but surely, losing the industrial leadership of the world.

Mr. WILSON might have added many instances in the building trade, in spite of the advantage that localisation gives to this industry as compared with those whose productions can be wholly manufactured abroad and imported into this country as finished products. Reinforced concrete, steel frame construction, asbestos products, magnesite floorings, all have come to us from abroad, often to the advantage of foreign patentees.

Successful technical education demands an adequate provision of three essentials—proper buildings and equipment, qualified and able teachers, and suitable scholars. With the first of these England is now fairly supplied, at least to the extent of which our other conditions allow us to make full use. Indeed, as far as our observation goes, the technical institutions of this country are in many cases to a large extent idle or not fully employed capital.

Neither of the other essentials can be said to have been as yet satisfactorily supplied. Mr. WILSON pointed out that the greatest weakness of our present system of technical education lay in the higher branches, especially in the matter of day technical work. He stated that whereas in Germany there were in attendance during the session 1907-8 at the ten technical universities no fewer than 11,692 fully-qualified and 2,299 partially-qualified day students, in England during the same period there were only 4,068 more or less—with the emphasis on the less—qualified day technical students attending the various technical colleges of University rank and the London and provincial technical schools.

It is only by the full devotion of a student's whole time and thought in day schools that teachers can be trained, and that the higher ranks of technical experts can be attained, from which must come the manager, the scientific director, or the "captain of industry." We lack as yet in this country the proper training of the teacher, who to be fitted for his work must be possessed of full knowledge and of the ability to impart that knowledge to others.

Another branch of higher technical training in which we are at present wofully deficient is that of research. Where have we in England, for example, anything corresponding to the work that is done in the technical laboratories of the University of Illinois? Part of our weakness in both teaching and research is due to the low scale of salaries paid to instructors and to the paucity of studentships for research. What inducement is there to an able man to make teaching in a technical institution his life's work? How can research be carried on if it is to be left to the men who can afford to disregard the necessity of earning a living or to those who can view it

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only as a hobby or recreation? As the President of the Association urged, we need such an organisation of facilities for technical education as will ensure that poverty or social circumstances should not prevent access to the highest forms of training the community could provide. Only in this way could the country make use of what might be one of its greatest assets, the practical and mental genius of its people.

Then with regard to the training of the foreman, the artisan, and the craftsman, the rank and file of skilled workers, what is it that militates against a far greater number of suitable students being found in our technical institutions? The Conference held that the following reforms were desirable:—(1) No child should be allowed to leave school before the age of fifteen, and the half-time system for children under fifteen should be completely abolished; (2) secondary schools should be of various types, but should include technical, secondary, and commercial secondary schools; (3) there should be a properly-graded system of scholarships, with maintenance, available at these secondary schools.

Other matters on which the members of the Conference were agreed were that continuation schools should be affiliated to the higher institutions in their respective districts; the curricula should be arranged in conjunction with the authorities of the higher institutions, who should have the right of entry for advisory purposes. That to render technical education more efficient the training of students employed in industries should be carried out by part-time instruction in technical schools. For this purpose it was necessary that the co-operation of employers should be secured, the hours of employment limited according to the amount of instruction required, admission to technical schools should be conditional on the students having reached a certain standard of education, and adequate provision should be made for easy transference from the secondary and continuation schools to the technical schools by means of scholarships, and by a linking-up of the various types of schools.

It was urged, among other things, that the work in each technical institution ought to meet local requirements, and ought to be of such a character as to place facilities for a University education within the reach of all suitable students; that technical education of a highly specialised character and technical research should be conducted in certain special institutions. This higher work should be organised on a national basis, and an adequate system of scholarships should be devised.

It is of the highest importance, not only in manufacturing industries, but in the building trade also, that a higher standard of technical education should be inaugurated and maintained, for efficiency in building makes for the national wealth, happiness, and comfort, as in every other department of industry, and if we in this country are not to be hopelessly left behind in the commercial and industrial struggle for supremacy we must look to it that our workers are as well trained and as efficient as those of other countries.

As an example of the meagre pay that is offered to technical instructors we may quote an advertisement that appears in the *Times* this week "for the position of Senior Demonstrator in the Technical Optics Department. The post is a full-time appointment, and the salary is 175*l.* per annum. Candidates should have a good knowledge, theoretical and practical, of visual and physiological optics, including anatomy and physiology of the eye, practical sight testing, and spectacle frame fitting. A knowledge of general optics is essential, and a knowledge of optical instruments or experience of optical workshop practice is desirable."

Barnsley Technical School requires, by an advertisement this week, an "Assistant Master to teach building-trade subjects, at a commencing salary of 110*l.* per annum; candidates must hold teaching qualifications in brickwork, masonry, building construction, and geometry." How can qualified teachers be expected when the pay is less than that of foremen in the trades that are supposed to be properly taught?

NOTES AND COMMENTS.

THE Royal Archæological Institute has now issued a most attractive detailed programme of its Summer Meeting at Oxford, which will be held from Tuesday, July 19, to Thursday, July 28 next. The programme gives concise particulars of the salient features of many of the buildings to be visited, with excellent plans, most of which are newly prepared, of the church of St. Mary the Virgin, Oxford; the Abbey Church, Dorchester; Ewelme Church, Hospital and Grammar School; Merton College; New College; Wadham College; St. John's College; Christ Church College and Cathedral; Witney Church; Magdalen College; the Prebendal House at Thame; Abingdon Abbey; Sutton Courtenay Manor House; Broughton Castle; Minster Lovell Church; Burford Church.

WHEN town planning becomes a subject of the examinations of the Royal Institute or any other professional body, aspirants for membership might be given, as a stock subject, the re-arrangement of Hyde Park Corner. For there is scarcely another place in this happy-go-lucky, "growed" up metropolis of ours that, in its inherent difficulties and muddle-headed improvements, furnishes a more difficult problem in town planning with any regard for dignity and the grand manner.

THEREFORE this is just the problem that an enthusiastic amateur of town-planning would be likely to tackle, and Mr. F. W. SPEAIGHT makes one more of his suggestions for the improvement of London *apropos* of a King Edward Memorial, advocating a grand King Edward Place, 725 feet long and 410 feet broad. The western boundary of this is to be the frontage of St. George's Hospital, which the author suggests as a suitable site for a National Opera House. The eastern boundary is a continuation of, though not in strict alignment with, the east side of Hamilton Place. The longitudinal axis of the proposed King Edward Place bisects and is at right angles to the frontage of St. George's Hospital, and the transverse axis intersects at the same focus the longitudinal axis and a vista diagonal line from Piccadilly and Grosvenor Crescent. The Green Park and Buckingham Palace Grounds are to be mulcted of a considerable area to form the new Place. On the intersection of the axes and the vista line is the proposed King Edward Memorial. At the eastern end of the longitudinal axis is suggested "a suitable site for the Shakespeare Memorial Theatre."

NOW we come to two great difficulties in any attempt to improve Hyde Park Corner—DECIMUS BURTON'S Arch and Constitution Hill. The former, with a proposed flanking colonnade, Mr. SPEAIGHT places on the southern side of his new Place, the arch being on the transverse axis. Constitution Hill, whose axial line misses the Memorial entirely, leads only to a back alley, outside the Place and its southern boundary, the colonnades tacked on to the arch, which itself now becomes meaningless leading to nowhere, and being at right angles to roadways back and front of it.

THESE are decided blemishes on an otherwise praiseworthy attempt to improve Hyde Park Corner. The difficulty of the Wellington Monument Mr. SPEAIGHT gets over very simply by sweeping it away altogether and suggesting its re-erection on the Horse Guards Parade or in Hyde Park. A good collateral proposal of the author's is the widening of Piccadilly by the addition of 20 feet width, to be taken from the Green Park.

APROPOS of memorials, the proposed monument to the Emperor ALEXANDER II. at St. Petersburg is to be the subject of an international competition, and is to consist of a bronze statue of the Emperor on a stone pedestal, to be erected at a cost of one million francs, exclusive of the bronze. Particulars of the competition may be obtained at any Russian Embassy, Legation, or Consulate.

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THE thirty-third annual report of the Society for the Protection of Ancient Buildings gives, as usual, a full account of the Society's activities during the past year, in the course of which the following buildings received the attention of the Committee:—The Globe Room, the Reindeer Inn, Banbury, Oxon; Bag Enderby Church, Lincolnshire; Bledlow Church, Buckinghamshire; The Old Guildhall, Boston, Lincolnshire; Branscombe Church, Devon; The Priory, Burford, Oxon; Chalton Church, Hants; Cherington Church, Shipston-on-Stour; Christchurch Priory Church, Hants; Churchover Church Tower, Rugby; Ruins of Cowdray House, Midhurst, Sussex; Whitgift Hospital, Croydon, Surrey (which for the present has been saved from demolition); Bridge, Croyland, Lincolnshire; Old Windmill, Croyland; Digby Church, Lincolnshire; East Harling Church Spire, Norfolk; Elmswell Church, Bury St. Edmunds, Suffolk; Exeter Cathedral (the proceedings of the Dean and Chapter at which, in relation to the west front, meet with strong condemnation from the Society); Fincham Church, Norfolk; Glastonbury Abbey, Somerset; The Old Hall, Groby, Leicester; Castle Gateway House, Guildford, Surrey; Hanborough Church, Oxon; Ilmington Church, Shipston-on-Stour; Old Grammar School, King's Norton, Worcestershire; Little Malvern Priory Church, Worcestershire; London, Old Church Tower, Hackney; London, Sir Robert Geffery's Almshouses, Kingsland Road, Shoreditch; OWEN GLYNDWR'S Parliament House, Machynlleth; Malinglee Chapel, Salop; Merstham Church, Surrey; The Lithen Chapel, Newbury, Berks; Newport Castle, Monmouth; Church of the Holy Sepulchre, Northampton; St. John's College, Oxford; Pembrey Church, Carmarthenshire; Puddletown Church, Dorset; St. Hilda's Church, Sherburn, Yorkshire; Old Grammar School, Shrewsbury; Skenfrith Church, Monmouth; Snaith Church, Yorks; Somersby Church, Lincolnshire; Wadworth Church, Yorks; Watford Church, Rugby; Welwyn Church, Herts; Church of St. Mary, Whaplode, Lincolnshire; Church of St. John the Baptist, Whitchurch, Aylesbury, Bucks; St. Mary Magdalen Church, Wiggenhall, Norfolk; St. Swithin's Church, Worcester; Worksop Priory Church and Gateway, Notts; St. Helen's Church, Stonegate, York.

WIMBLEDON AND MERTON HOSPITAL COMPETITION.

THE result of the above competition was announced at the meeting of the organising committee held at the Wimbledon Town Hall on Monday evening last. Mr. W. A. Pite, F.R.I.B.A., the architect of the new King's College Hospital, Camberwell, was the assessor appointed by the President of the Institute, and out of the seven designs sent in his report recommended the one under the motto "Sub Cruce."

After opening the sealed envelope the Chairman, Alderman T. C. Summerhays, stated that the successful competitor, Mr. Francis Hatch, had had five years' experience in the building of military hospitals for the War Department. Sir Sidney Hoare, Bart., said that as Mr. Hatch would be employed in the architectural office of the War Office during the day it appeared to him that the erection of the hospital would be a sort of "holiday job," and that it would be doubtful who had first claim on his time—the War Office or the Hospital Committee. After considerable discussion it was decided to consult the assessor, Mr. Pite, before making a final decision.

The designs were hung on the walls of the council chamber.

The design placed first, "Sub Cruce," could be greatly improved if the site is extended, as has been proposed. This competitor has arranged his plan in three blocks running approximately north and south and connected by short corridors of the usual type. The main entrance and administration department are at the north end of the eastern block. The male ward for eight beds is at the south end of this block, the ward kitchen, bath-room, lavatory, &c., and the two single wards required being in the centre of the block. A disconnected sanitary tower is provided at the north-east corner of the male ward.

The operating theatre, with an anæsthetising room and a recovery ward, is conveniently situated at the northern extremity of the central block. The remainder of this block is for women and in plan duplicates the male accommodation.

The western block is devoted to the kitchen department, with the nurses' dining and recreation room and the matron's suite of sitting, bath, and bedrooms. A small mortuary is shown in the south-western portion and space is provided for a future laundry.

On the first floor the children's ward of four beds with 88 superficial feet of floor-space for each, is situated above the administrative offices. The accompanying ward kitchen and usual sanitary accommodation is conveniently arranged.

In the upper part of the western block are five nurses' bedrooms and accommodation for the cook and three servants.

A boiler-house is placed in the basement and radiators are installed where considered necessary. A detailed examination of the drawings shows that the two eight-bed wards are provided with central ventilating stoves with descending flues; 92 superficial feet of floor space is given to each bed and the wards are 12 feet high.

The elevations are rather tamely designed in the Georgian manner and have a decidedly "official" appearance. The brick walls are relieved with dark red dressings and there is a stone main entrance lacking in dignity and importance. The chief criticism that may be made of the plan is that the male and female eight-bed wards are only about 32 feet apart, and the windows of the male single wards are only 26 feet from those of the female wards opposite. This does not allow for sufficient fresh air and sunlight. This defect may be remedied by an extension of the site; in other respects the plans are very well worked out and show considerable knowledge of hospital sanitation.

The other designs are not placed in order of merit, but that by "Asepsis" deserves close consideration. This design is admirably adapted to the site, and if additional ground is not to be purchased it would probably work out far better than the design placed first. The plan is in the form of a letter "H" with the two main blocks running north and south. A long corridor, with the operating block well disconnected on its north side, connects these two blocks. The administrative and kitchen departments are in the western block with the staff bedrooms on the first floor. Unfortunately the author has omitted one of the five nurses' bedrooms required.

The eastern block has the male eight-bed ward in its northern half and the corresponding female ward to the south, each with sanitary towers to the east and verandahs to the west.

The four single wards and a children's ward with six beds are on the first floor, but no patients' lift is provided. A balcony or covered way over the main corridor to the eastern block would make a great improvement to this plan. Apart from the above and one or two other minor defects this design is an excellent example of modern hospital planning.

The elevations have a pleasing domestic character with rough cast freely employed.

"X-Rays" submits a complicated star-shaped plan, which is entirely unsuited to the site and would prove a rabbit warren if executed. His elevations and perspective are very nicely designed and show a complete knowledge of the modern treatment of English Renaissance. As the author sent in no estimate of cost he appears to have realised at the last moment that his design was too elaborate and expensive for a hospital.

"Minerva's" plan shows a very effective scheme, but it is spoilt by several palpable mistakes. Two of his single wards are lighted from the north only and a pair of sanitary towers block out light and air and ruin his south elevation. His perspective in colours represents a very pleasing front elevation chiefly in brown Crowborough bricks.

"Air" sends in a very sketchy and unfinished design, which shows that he might have done much better if he had allowed himself more time. He violates one of the cardinal requirements by putting his male ward on the first floor. His elevations are attractive and the whole design would work out well in practice.

"Hygeia" also submits an unfinished design. His plan is by far the simplest of those submitted and shows a good grasp of the problems to be solved. The first-floor plan, however, is not so good. The children's ward is rather awkward and no bathrooms are provided for the nurses and servants. His front elevation is greatly lacking in proportion.

"North Light" has uncomfortable male and female wards with badly planned accessories. The author has made a serious mistake by placing his kitchen in the south part of the site. The Georgian elevations are quiet in tone and sound in design.

When the sealed envelopes were opened the authors' names and estimates of cost were read out to the committee as follows:—

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"NORTH LIGHT."—Messrs. Harold Bailey, F.R.I.B.A., & Douglas Wood, A.R.I.B.A., London, W., 5,726*l.*

"AIR."—Mr. J. S. Broclesby, A.R.I.B.A., Merton Park, Surrey, 6,088*l.*

"HYGEIA."—Mr. F. J. Forster, A.R.I.B.A., Wimbledon, 6,000*l.*

"SUB CRUCE."—Mr. Francis Hatch, 71 Queen's Road, Wimbledon, 6,118*l.*

"MINERVA."—Mr. C. W. Pike, Wimbledon, 6,250*l.*

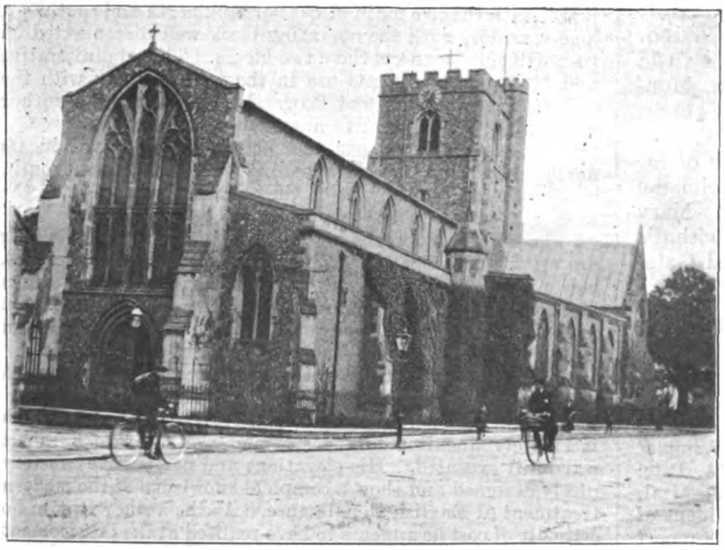
"ASEPSIS."—Mr. John* Saxon Snell, Wimbledon, 5,926*l.*

"X-RAYS."—Mr. R. J. Thompson, F.R.I.B.A., Wimbledon, price not stated.

The design placed first was stated by its author to contain 209,000 cubic feet and the price to be 7*d.* per foot.

GREAT BERKHAMPSTEAD.†

THE picturesque old town we have had the pleasure of visiting this afternoon is a place of considerable antiquity and historic interest. In Saxon times it was a place of residence of the Kings of Mercia, and by some it is supposed to be the site of the Roman station called Durocobrivis, "the city of the marshy stream." It lies on the old Roman way of "Akeman Street," now the High Street, which forms the main road from London to Aylesbury, and, judging from the fact that Roman coins and other remains have been found in the vicinity, it seems pretty clear that the Romans had a camp here. There is a tradition that St. Paul the Apostle visited Berkhampstead, though whether this is true or not there is no evidence. The most conspicuous event in the history of the place is no doubt the submission of the English to William of Normandy. Immediately after the Battle of Hastings William marched on London, crossed the Thames at Wallingford, and encamped at Berkhampstead. To him came Edgar Atheling, together with the Archbishops Stigand and Aldred, the Earls Morcar and Edwin, Wulfstan, Bishop of Worcester, and other nobles and prelates "in obedience to necessity (says a cotemporary Saxon chronicle), and, to the misfortune of their country, submitted to the foreigner. They took oaths of peace and fidelity to him, gave him hostages; and the foreigner, in return, promised them mildness and clemency. He then set forward towards London, and, regardless of his promise, allowed all in the way to be ravaged and burned." (Thierry's "Conquest of England by the Normans.")



ST. PETER'S CHURCH, BERKHAMPSTEAD.—FROM SOUTH-WEST.

It appears that about this time William resolved to go to St. Albans, where the Abbot Frithric was known to be refractory to the Norman claims, but Frithric, hearing of his coming, had trees felled and placed so as to cause as much obstruction as possible. William therefore came again to Berkhampstead, and caused Frithric to be brought before him. The Abbot came. "Why," asked William, "hast thou cut down thy woods in this manner?" "I have done my duty," answered the Saxon monk, "and if all my order had done the same, as they might and ought to have done, perhaps thou would'st not have penetrated so far into our country." (Thierry.)

The most precious monument of the ancient condition of this kingdom which has been preserved to our times, the "Domesday Book," was compiled by order of the Conqueror. Its record concerning Berkhampstead runs as follows:—"The Count of Mortain holds Berchehamstede. It is assessed at 13 hides. There is land for 26 ploughs. In the demesne are 6 hides, and on it are 3 ploughs, and there could be other 3. A priest there and (*cum*) 14 villeins and 15 bordars have 12 ploughs, and there could be 8 ploughs more. There 6 serfs and a certain ditcher (*fossarius*) have a half hide, and Rannulf, a Serjeant of the Count (*serviens comitis*), 1 virgate. In the borough (*burbio*) of this vill are 52 burgesses who render from toll 4 pounds and have half a hide and 2 mills worth (*de*) 20 shillings. There are 2 arpents of vineyard. Meadow is there sufficient for eight plough teams, pasture for the live stock of the vill, and woodland to feed 1,000 swine and (worth) 5 shillings (besides). In all the value is 16 pounds; when received it was 20 pounds; T.R.E. 24 pounds. This manor Edmar, a thegn of Earl Harold, held." (Victoria History of Hertfordshire.)

From the reference to the "demesne," or the lord's portion of the manor, it seems pretty clear that Robert of Mortain (Moreton, Mortaigne) himself occupied the castle, and probably established the vineyard for the purpose of growing fruit to make his own wine. The reference to a "ditcher" may be regarded as evidence of the importance of the castle moat or ditch, whilst the 4*l.* derived from the burgesses for "toll" was probably a composition for market dues. It might be thought that Berkhampstead would have been a very prosperous place, owing to the trade brought to it in consequence of the residence of so important a person as the King's brother, yet the yearly value is found to have dropped from 24*l.* to 20*l.*, and then to 16*l.*

There are three parishes in Hertfordshire bearing the name of Berkhampstead—namely (1) Berkhampstead St. Peter, or Great Berkhampstead; (2) Berkhampstead St. Mary, or Northchurch; and (3) Little Berkhampstead, about thirty miles distant between Hatfield and Broxbourne. The name Berkhampstead is probably derived from *berg*, a hill, and *ham* and *stede*, both signifying a town. The name appears to have been spelt in various ways at different times, for in the eleventh century it is given as Beorhamstede and Berchehamstede, and from the twelfth to the fourteenth century as Berchamstede and Berkhamsted, and even at the present day it is spelt alternatively as Berkhamsted and Berkhampstead. The wealth of the place at the time of the Norman survey is seen in the number of ploughs, each plough with its team of eight oxen; the meadows, which provided hay for the oxen and pasture for the live stock; the woodland, through which vast herds of swine roamed and fattened on the mast that fell from the oak trees, and from which timber for building and domestic purposes was obtained; the fisheries, which paid rent in eels; and the water-mills, which were employed to grind the corn.

"Berkhampstead is of interest in many ways: historically for its early mention in English times as the place where the Norman Conquest 'received,' in Mr. Freeman's words, 'the formal ratification of the conquered'; archæologically for the earthworks of its castle; and feudally as the head of a well-known 'honour' carved from the mighty fief of Robert of Mortain." (Victoria History of Hertfordshire.)

The present parish of Berkhampstead St. Peter is believed to have formed part of the parish of Berkhampstead St. Mary at the time of the Conquest. William, the son of Count Robert of Mortain, granted the advowson of the church of Berkhampstead, together with the advowson of the chapel of the castle, to the monastery of St. Mary of Grestein, in Normandy. The castle chapel is believed to be identical with the chapel of St. James, the parochial chapel of the borough. A new church dedicated to St. Peter, which took the place of the old chapel of St. James, was commenced, probably by Geoffrey Fitz-Piers, during the reign of Richard I. (1189-99), and when the existing church was built early in the thirteenth century and the new parish of

* "John," probably a mis-copying for "Alfred," the well-known F.R.I.B.A.

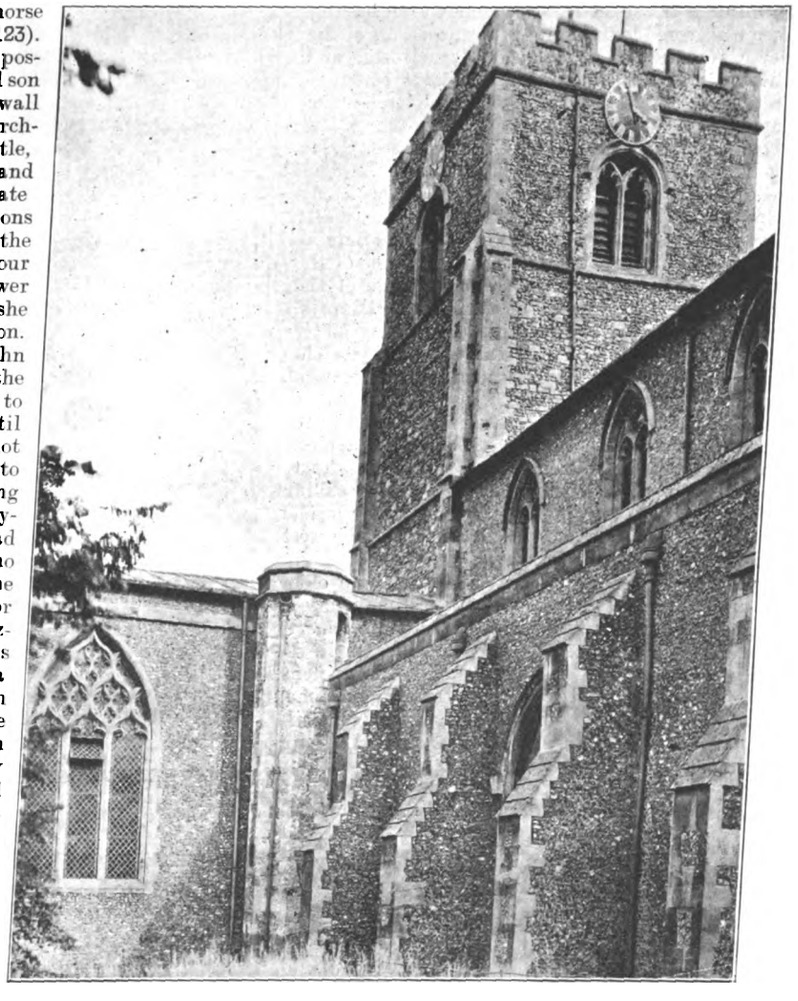
† A paper read by Alfred Burch, at a meeting of the Upper Norwood Athenæum, at Great Berkhampstead, on Saturday, May 21.

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St. Peter probably formed, the Abbot of Grestein relinquished the patronage of the old church of St. Mary, but retained a pension of 2*l.* a year from it. The chapel of St. James is believed to have stood on the main road between Berkhampstead and Northchurch, and near to it was a well, called St. James's Well, from which the principal water-supply of the town was then obtained. It may be remarked here that the fair, so often held on the feast-day of the saint to whose honour the parish church is dedicated, was held on St. James's Day.

The history of Berkhampstead is practically the history of the castle, which was built by Count Robert of Mortain on the site of a stronghold which existed in Saxon times, but of which little or nothing is known. In 1104 the castle was in the King's hands, the son of Count Robert having taken part in the rebellion against Henry I. and been dispossessed of his lands. The castle and honour were then bestowed by the King on his Chancellor Randulph, who, whilst showing the King some work which had been carried out at the castle, fell from his horse and was so hurt that he died in three days (1123). The castle and honour next came into the possession of Reginald de Dunstanville, a natural son of Henry I., upon his creation as Earl of Cornwall in 1140. In 1155 we find Thomas Becket, Archbishop of Canterbury, in possession of the castle, to whom it had been granted by Henry II., and who is said to have lived here in magnificent state After Becket's death Henry on several occasions held his court here, and in 1156 he granted the town its first charter. About 1190 the honour with the castle and manor were granted as dower to Berengaria, the Queen of Richard I., but she was dispossessed by King John on his accession. Pope Innocent III. endeavoured to persuade John to make restitution, and threatened to place the honour and all the lands which the Queen ought to have had as her dower under an interdict until satisfaction should be made. The affair was not settled, however, till 1216, in spite of an order to publish the sentence of interdict, when the King paid up the arrears and granted an annual payment to Berengaria. Meanwhile John had farmed the honour to Geoffrey Fitz-Piers, who became Earl of Essex. In 1204 John settled the honour on Queen Isabella, his second wife, for life, but in 1205 it was granted to Geoffrey Fitz-Piers and his heirs. Nevertheless, on Geoffrey's death Berkhampstead was placed in the hands of a keeper on behalf of the Crown till 1215, when Isabella received confirmation of the grant made to her in 1204. Whilst Queen Isabella was in residence at the castle in 1216 it was besieged by Louis, the French King, to whom the barons had offered the English Crown, and after a siege of a fortnight it surrendered. After John's death Isabella married the Count de la March, and in 1222 the castle and honour were delivered to them. When Richard II., son of King John, was created Earl of Cornwall in 1225, the castle and honour were possibly granted to him, for in 1244 they were confirmed to his wife as dower in the case of his death. Richard lived frequently at the castle, and died there in 1272. He was succeeded by his son Edmund, Earl of Cornwall, who was born at the castle in 1249, and when he died his cousin, Edward I., succeeded him. Edward granted the honour, including the castle and manor, in 1303 to Margaret of France, his second Queen; but Edward II. appears to have dispossessed his step-mother, and granted it, in 1309, to Piers Gaveston, his favourite. It was at Berkhampstead that Gaveston married the King's niece, Margaret de Clare. The King himself was present at the ceremony, which was on a great scale, and he is said to have scattered silver pennies to the amount of 7*l.* 10*s.* 6*d.* over the heads of the couple on entering the church.

In 1310 the grant to Queen Margaret was confirmed, and she held it till her death in 1317, when Edward II. granted it to his Queen. When Edward the Black Prince was created Duke of Cornwall in 1336 the honour of Berkhampstead was granted to him, and he resided here as often as the French wars allowed him to return to England. He entertained many princes and nobles, and John, King of France, who had been captured at the Battle of Poictiers (1356), was for a time confined in the castle as prisoner. From the Black Prince the castle descended to his son Richard, who became Richard II., and it was at this time that Geoffrey Chaucer, the poet, acted as clerk of the works at the castle. On the accession of Henry IV. the castle and honour were granted to his son Henry, Prince of Wales and Duke of Cornwall, and later were held by Margaret of Anjou, the Queen of Henry VI. Edward IV. in 1469 granted the castle and honour to his mother Cicely, Duchess of York, for life. She resided at the castle till her death there in 1496, when the castle ceased to be used as a residence and was allowed to fall into decay. The castle and honour then passed to her granddaughter Elizabeth, the Queen of Henry VII. In 1509 it was granted to Catherine of Aragon, and afterwards to Anne Boleyn and Jane Seymour. Edward VI. granted the manor to his sister the Princess Elizabeth, in 1550, for life, and she, in 1559, leased the castle to Sir Thomas Benger. The lease appears to have been surrendered, for a fresh one was made to Sir Thomas Carey and his wife in 1580, who built the mansion now known as Berkhamp-



ST. PETER'S CHURCH, BERKHAMPSTEAD.—FROM NORTH-WEST.

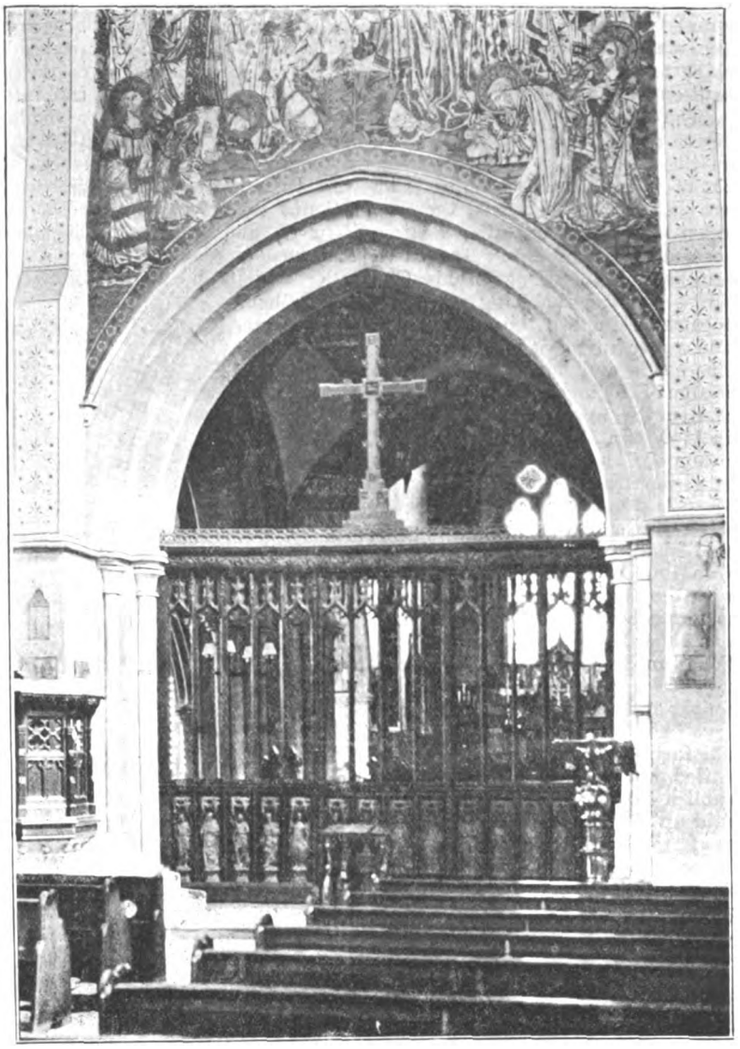
stead Place. In 1610 the castle and honour were granted to the eldest son of James I., and in 1615 to his brother Prince Charles, afterwards Charles I. During the Commonwealth the honour and manor were sold by the Parliamentary trustees, but at the Restoration returned to the Crown, and, as parcel of the Duchy of Cornwall, remained to the Crown or the eldest son of the reigning monarch till 1862, when the manor was purchased by trustees for Earl Brownlow, a brother of the present Earl (mainly from the Victoria History of Hertfordshire).

The position of the castle was well chosen, commanding as it did the road and narrow valley through which both the road and river pass. Entrance was gained from Castle Street by a narrow passage across the swamp. The ancient drawbridge has now entirely disappeared. The castle itself is composed of the keep, the inner court, and the ramparts. The inner ward is described as an oval about 500 feet by 300 feet, and the mound is a truncated cone about 60 feet high and 40 feet in diameter. The inner ditch or moat has now very little water in it, but it is deep and about 50 or 60 feet broad at its narrowest part. It was doubtless a very

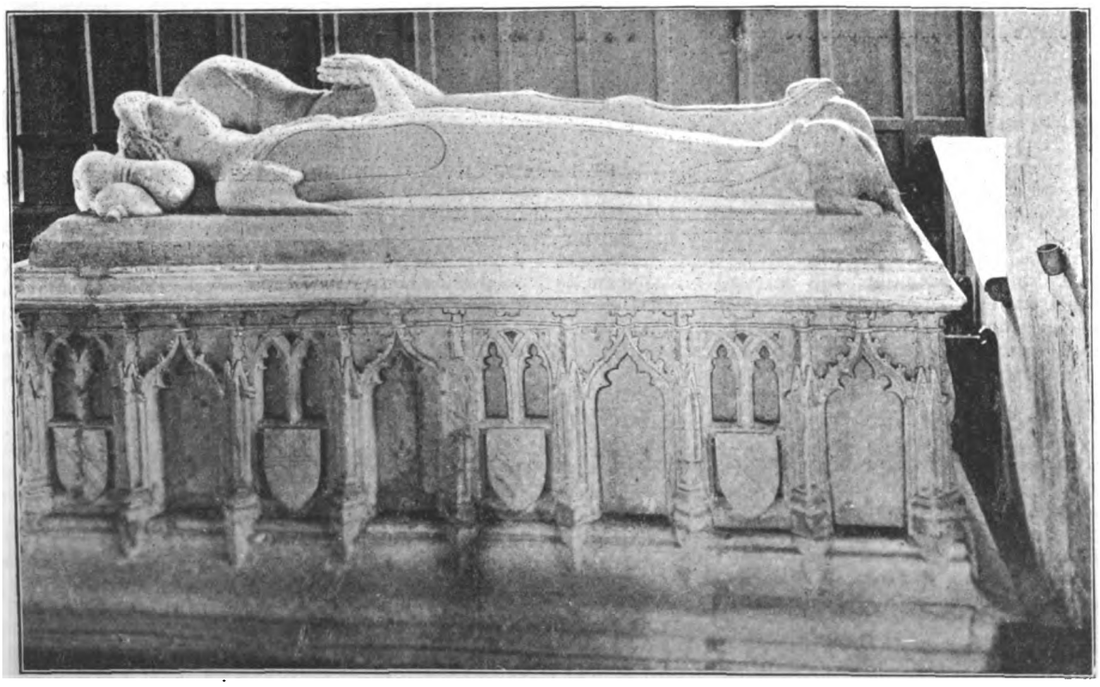
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formidable defence. A very good idea of the original form of the castle and of its strength may be gained from a walk along the middle bank or rampart, which is believed to have been formed about the time of the Conquest, probably by Earl Mortain. The outer ditch used also to encircle the castle, and contributed largely to its defence. The outer bank is broken by a deep cut opposite the mound, in order to admit water from the river Bulbourne to the outer ditch. Only traces of the foundations of the castle keep which stood at the top of the mound now remain. Very little of the ancient masonry of the castle remains. What there is consists of chalk and flint rubble bound together by white mortar, and was probably faced with picked and coursed flints with quoins and dressings of ashlar. (Loosley's Historical Guide to Berkhampstead.)

The church, which is dedicated to St. Peter, is believed to stand on the site of an earlier building, a fragment of a very early arch having been discovered in 1881 in the western wall of the north transept. The church is cruciform, and the tower stands at the central point of intersection. It was rebuilt in the reign of Henry III. (1220), and is one of the oldest ecclesiastical buildings in Hertfordshire. Its architecture has undergone much change. The oldest portion is the chancel, which is Early English. The Chapel of St. Katherine, built out of the south transept, is of the same date as the main building, the Decorated portions of the transepts, the chapels on the north side of the chancel, and the chantry of St. John the Baptist occupying a part of the south aisle, being added about the end of the fourteenth century. The clerestory was added to the nave and the present roof constructed about 1450, in the Perpendicular English period. The tower was raised to its present height about 1535; it contains a clock and eight bells, and has an embattled parapet. The walls are of flint masonry, with ashlar dressings of Totternhoe stone. The nave consists of seven bays, and is 14 inches wider at the west than at the east, and is also a little out of alignment, due probably to the existence of an older building on the site. In the chancel may be seen the closed doorway which led into a formerly existing north vestry. There is a piscina in the chancel of which the drain alone is ancient. Some beautiful old fourteenth-century glass may be seen in one of the lancet windows in the chancel, and in the other the arms of Henry Chicheley, who became Archbishop of Canterbury in 1414, and two shields of the royal arms, France quartered with England, one surmounted with a crown. The east window is a memorial to the poet Cowper, whose father was some time rector. Near the foot of the centre light the poet may be seen writing at a desk. The fine west window, divided



ST. PETER'S CHURCH, BERKHAMPSTEAD.—THE ROOD SCREEN.



ST. PETER'S CHURCH, BERKHAMPSTEAD.—TOMB UNDER NORTH ARCH OF CHANCEL.

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into five lights, contains the principal subjects in two rows of five each. "The subjects commencing on the left-hand side at the top represent:—(1) The Martyrdom of St. Ignatius; (2) the Revelation to St. John the Divine; (3) the Charge to St. Peter (John xxi. 16); (4) the Call of St. Peter and St. Andrew; (5) the Martyrdom of St. Polycarp; (6) the Martyrdom of St. Stephen; (7) St. Barnabas bringing to the Apostles the money he had received from the sale of his land; (8) St. Luke, the physician, healing the sick; (9) the Conversion of St. Paul; and (10) the Martyrdom of St. Andrew. In the head of the centre light is St. Catherine, and below are four heads intended to represent Isaiah, Jeremiah, Ezekiel, and Daniel. In the tracery may also be seen St. George destroying the Dragon, and St. Augustine in his episcopal robes." (Cussans.)

There are in the church a number of interesting brasses and tombs. Under the archway separating the chancel from the north transept are the remains of a fine altar tomb surmounted by recumbent figures of a knight in armour and his wife. The lady's arms are broken off short, however, and the effigies are otherwise disfigured. Cussans says they are those of one of the Incent family and his wife, a Torrington, but the inscription has disappeared. Under the archway at the eastern end of the north aisle is the tomb of John Sayer, the chief cook to Charles II. and founder of some almshouses in the town, and another of Purbeck marble of Sir John Cornwallis, Knight, a member of King Edward's VI.'s council. A long brass affixed to the wall near the rood-screen commemorates the rectors of the church from 1222 to the present day. The mosaic reredos on the subject of the Crucifixion, and the fresco in the nave, both in the memory of a former rector, are remarkable features in the adornment of the church. The rood screen, which is in part fifteenth-century work, was removed into St. Katherine's Chapel in 1870, but has since been reinstated in its original position, and repaired and enriched by filling in the lower panels with fourteen carved figures representing patron and other saints of the Church. The octagonal pillar between St. John's Chapel and the south aisle is an interesting piece of fourteenth-century work. The brasses include one to John Raven, esquire to Edward the Black Prince, on a pillar adjoining St. John's Chapel, and below it one of a lady, about 1370. Others, a half-effigy of a priest, about 1400; Robert Incent (1485) and Katherine his wife (1520), in St. John's Chapel; and a husband and wife, probably Waterhouse family, on the back of which is part of an older and unusually elaborate and well-engraved inscription, about 1470, to Thomas Humfre, goldsmith, of London, and Joan his wife.

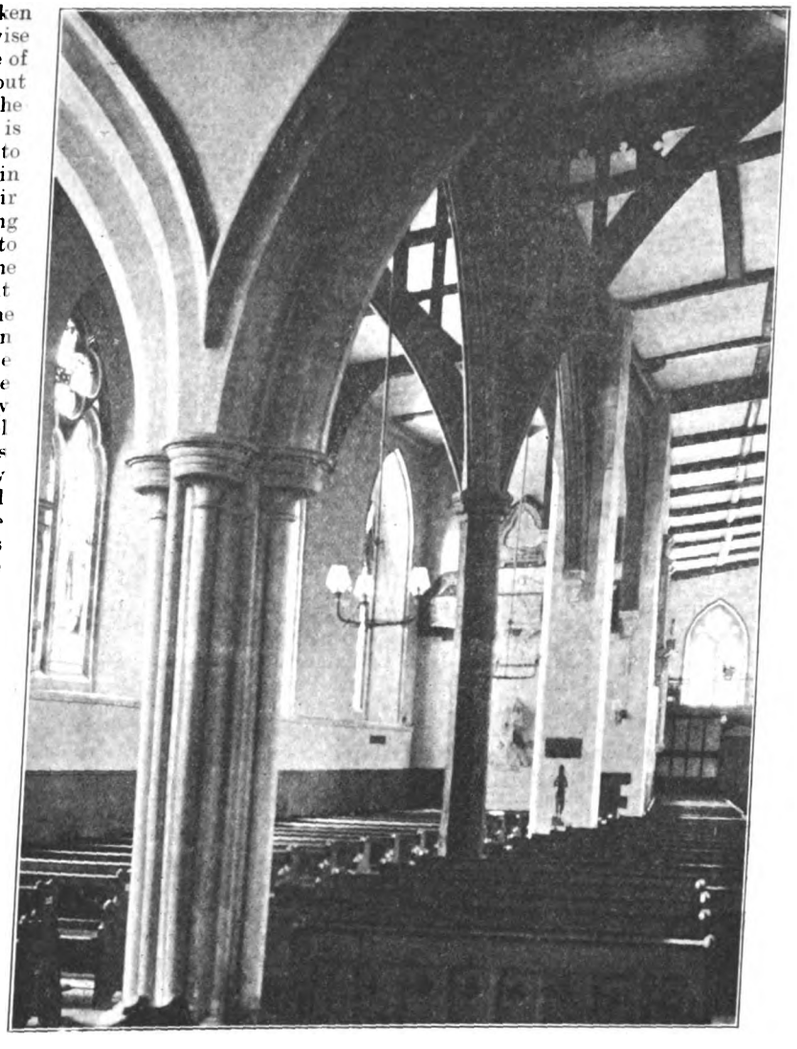
The first book of the church registers is of parchment, and dates from 1538. Among the church plate is a communion cup, 1629, a paten bearing the hall-mark for 1706, and another paten dated 1637.

The Charter granted by Henry II. in 1156 is a very interesting one. It confirmed to the men and merchants of the town all laws and customs which they had in the time of Edward the Confessor, and "granted that, whithersoever they went with their merchandise throughout England, Normandy, Aquitaine, and Anjou, they should be quit of toll, portage, passage and piccage, pannage and stallage, suits of shires and hundreds, aids of the Sheriffs and Serjeants, geld, Danegeld, hidage, blodewhite and bredewhite, murders and other things pertaining to murders, works of castles, walls, ditches, parks and bridges and all secular custom and servile work." (Victoria History.) Further favours were conferred on the town in 1477 by Edward IV., and in 1484 Henry II.'s Charter was confirmed by Richard III. Queen Elizabeth again confirmed it in 1598, and James I. granted a new Charter in 1619. The borough officers, however, says Chauncey, "let their government fall, having grown very poor." An attempt to revive the Charter in Charles II.'s reign failed, and at the beginning of the next century the town neglected to choose a bailiff, since when nothing has been done to recover the ancient charters.

At the lower end of Castle Street are several picturesque seventeenth-century cottages standing below the level of the raised roadway approaching the canal, and opposite the church is an old half-timbered house where John Incent, Dean of St. Paul's, who died in 1545, is said to have resided. Some old houses, including the old Court house with a fine open roof of sixteenth-century date, may also be seen in Back Lane, close to the church.

In King John's time there were in the town two hospitals for poor and infirm persons, one dedicated to St. John the Baptist and the other to St. John the Evangelist. Geoffrey Fitz-Piers, Earl of Essex, granted the custody of both hospitals to the House of St. Thomas of Acon in London, which is supposed to stand on the site of the birthplace of Thomas Becket, and now the Hall of the Mercers' Company. In Richard II.'s reign there was also at Berkhampstead a Hospital of St. Thomas the Martyr. (Dugdale's "Monasticon Anglicanum.")

Berkhampstead School is now the glory of the town. Although founded early in the sixteenth century it was the offspring of a still earlier foundation, the Hospital of St. John the Baptist, which had been given by Geoffrey Fitz-Piers. John Incent, who was a native of Berkhampstead, became president of the Brotherhood of St. John about 1520. He supported a proposal that the lands of the Brotherhood should be used for founding the school, obtained a Royal Charter in 1541, and proceeded to build a school for 144 boys. The school was more or less a failure for a long period, till in 1841 it was reorganised and the management vested in a board of governors. Since then the school has grown considerably in numbers and new buildings have been added, including swimming-baths, gymnasium, laboratories, and lecture and class-rooms, together with a very beautiful chapel.



ST. PETER'S CHURCH, BERKHAMPSTEAD.—THE SOUTH AISLE.

For the information contained in this paper I am greatly indebted to the Victoria History of Hertfordshire, on the pages of which I have drawn very largely; to the "Historical Guide to Berkhampstead," published by Mr. Loosley; and to the works of Cussans, Kelly, Dugdale, Tompkins, and

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Andrews. The thanks of the Society are also due to the Rev. T. C. Fry, D.D., the head-master of the Grammar School, for his courtesy and the facilities which he very kindly granted by which the members have been enabled to see the old hall of the school and the chapel which he built and presented to the school.

INTERNATIONAL HYGIENE EXHIBITION, DRESDEN, 1911.

A UNIQUE undertaking has been planned in Dresden for next year. It is true that this undertaking passes under the name of an International Exhibition, but it is only in name that any similarity will be found to exist with other international exhibitions. Industrial firms will do well to inquire into the organisation, extent, and prospects of the International Hygiene Exhibition before classing it with the monster displays which, as is usually admitted, do not bring a return for the money spent in sending exhibits.

The Dresden Exhibition is essentially a scientific exhibition, and inasmuch as some 200 congresses will be held during the six months of its existence in connection with the forty-four groups and sub-groups, the visitors to this Exhibition will include nearly every hygienist of note in the whole world. The significance of this is obvious. While the hundreds of thousands who flock to the White City do not contain an appreciable percentage of persons who understand the nature of the exhibits, and who might become ultimate purchasers, at Dresden, in connection with discussions on each branch of hygiene, the visitors who will enter the Industrial Section and examine with care each of the exhibits will be experts and either direct purchasers or persons whose stated opinion will induce public bodies and private individuals to become purchasers. The general public will be present at Dresden, but will chiefly patronise the Popular and the Sport Sections. Those who are not experts, but who still are attracted to the Industrial Section, will prove of greater value to the exhibitor than the indiscriminate mass.

In the next place, only the best exhibits will be admitted into the Exhibition. A very powerful British Committee, with H.R.H. Princess Christian as the Patroness, Sir Thomas Barlow, Sir William Bennett, Mr. Henry Butlin, Sir William Church, Mr. J. M. Cotterill, Mr. Andrew J. Horne, Mr. W. A. Jamieson, Surgeon-General Sir Alfred Keogh, Mr. D. N. Knox, Mr. John Lentaigne, Sir Thomas Oliver, and Sir William Treloar as Vice-Presidents, and nearly every hygienist of importance as the members, has been appointed to organise the scientific department. This committee will exercise a strict censorship over the industrial admissions; a second control will be exercised by the Board of Trade, whose co-operation has been promised, and the administration in Dresden reserves itself the right of refusing any undesirable exhibit, in the third instance.

The firm that succeeds in obtaining a stall at Dresden will have the knowledge that the exhibits have been passed by the committee as satisfactory, and can trade on this knowledge.

In the third place, the International Hygiene Exhibition is costing a mint of money to organise, and there will be but comparatively little return. The grounds are as extensive as those of the White City—for a special exhibition, be it remembered. The co-operation of the first authorities in the world has been gained, and an International Congress (on hygiene and demography) has been postponed for one year on its account. This means that such an undertaking is not likely to be repeated for very many years to come. In the past there have been many smaller endeavours of the same nature, and many which were scientific only in name. No exhibition has ever been held which can compare with the Dresden undertaking for completeness, vastness, and exclusiveness.

The industrial section is divided up into the following groups:—Chemical industry; scientific instruments and apparatus; settlements, dwellings, housing, &c.; foodstuffs and food accessories, beverages; clothing and the care and protection of the body; profession and labour; provision and care for infants and the young; traffic conditions on land and sea; technics, machinery; watering-places, health resorts, mineral waters; cosmetics and other toilet preparations and requisites; hygiene in connection with the Army, Navy, colonists, &c.; care of the sick, ambulance work, hospitals, life-saving service; physical exercise, games and sports; hygiene in literature and the arts.

Further information can be obtained from the offices of the International Hygiene Exhibition, 47 Victoria Street, S.W.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) treats us to some examples of American railway stations, the instances selected being the Union Station at Baltimore, Long Beach Station and Manhattan Beach Station on the Long Island Railroad, for all of which Mr. Kenneth M. Murchison is the architect. Other illustrations are from typical private houses in Philadelphia by Mr. Charles Barton Keen, the Jenkintown National Bank, Pennsylvania, and some examples of details by Messrs. Heacock & Hokanson.

Het Huis (Amsterdam) continues its account of Enkhuizen, Old and New, with further illustrations of its picturesque buildings. Other illustrated articles deal with the town of Grootebroek and other Friesland towns. As examples of modern architecture views of the interior of a villa at Roermond.

Stone (New York) illustrates as instances of stonework the Polk County Courthouse at Crookston, Minnesota, of which Messrs. Kinney & Detweiler are the architects, and an elaborate example of a richly carved doorway in pink Maine granite in a new building at the corner of Sixth Avenue and Fortieth Street, New York.

Engineering Record (New York) contains an account of the pulling down of a skyscraper, the Gillender building, New York, erected in 1897 on a site 27 feet by 74 feet and 200 feet high, with a tower 270 feet high.

La Construction Moderne (Paris) illustrates a Parisian block of bachelor flats in the Rue Fessart of which MM. Albert & Maurice Turin, are the architects, and the reservoir at Montreuil-sous-Bois, of the Compagnie Générale des Eaux, to which a certain architectural character has been given in the external wall treatment and entrance to the machine room.

ILLUSTRATIONS.

DESIGN FOR NATIONAL MUSEUM OF WALES, CARDIFF.

MR. FULTON, in preparing the competition design for the Welsh National Museum which we illustrate this week, considered that for such an important building a central hall or corridor was necessary, not only for easy circulation, but combining the three Arts in a noble hall which would interest and educate the people. A spacious and well-lighted entrance-hall was also considered necessary.

THE partnership hitherto existing between Messrs. George J. Skipper, F.R.I.B.A., & F. W. Skipper, of Norwich, architects, has been dissolved, and Mr. F. W. Skipper will now practice at 55 London Street, Norwich. We have not heard the intentions of Mr. George J. Skipper.

THE King has accepted an advance copy of the new edition of Darlington's "London and Environs," carefully revised by Mr. E. T. Cook, M.A., with new maps and plans and indexes of 12,000 references.

THE Association of Professional Fire Brigade Officers at their recent annual meeting passed a resolution, with one dissentient, to the effect that it was desirable that manufacturers of fire appliances should endeavour as far as possible to standardise the parts of their various machines so as to make them interchangeable.

THE sub-committee appointed by Dundee School Board to inquire into the question of school accommodation in the west end has lost no time in coming to a conclusion. As the result of their cogitations they recommend the erection of a new academy in the west end at a cost of 25,000*l.* or 30,000*l.*, and the conversion of the Harris Academy into a central supplementary school on the lines of Stobswell School.

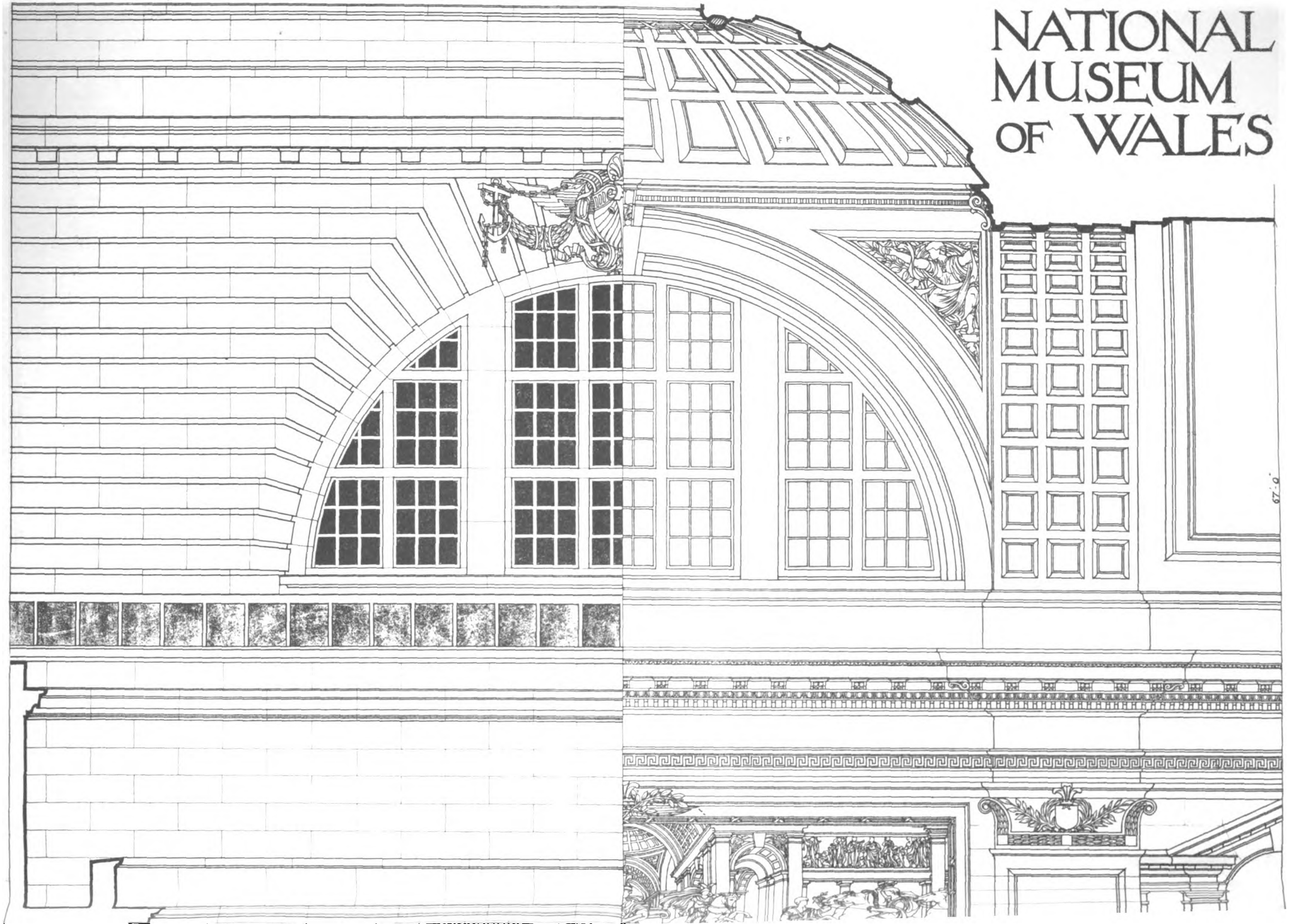
THE Home Secretary last week furnished a table showing the number of persons employed and accidents in slate mines and slate quarries in North Wales during 1909. The total number of persons employed in slate mines was 3,116, of whom 1,202 were inside and 1,914 outside. In slate quarries the total employed was 7,813 (3,101 being inside and 4,712 outside). The number of persons killed by accidents in slate mines was three inside and one outside, and in quarries seven inside and one outside. The total number of persons injured by non-fatal accidents disabling for more than seven days was 211 in slate mines (99 inside and 112 outside), and in slate quarries 970 (643 inside and 327 outside).

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NATIONAL MUSEUM OF WALES



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COMPETITION DESIGN FOR THE NATIONAL MUSEUM OF WALES.

By Mr. JAMES B. FULTON, A.R.I.B.A.

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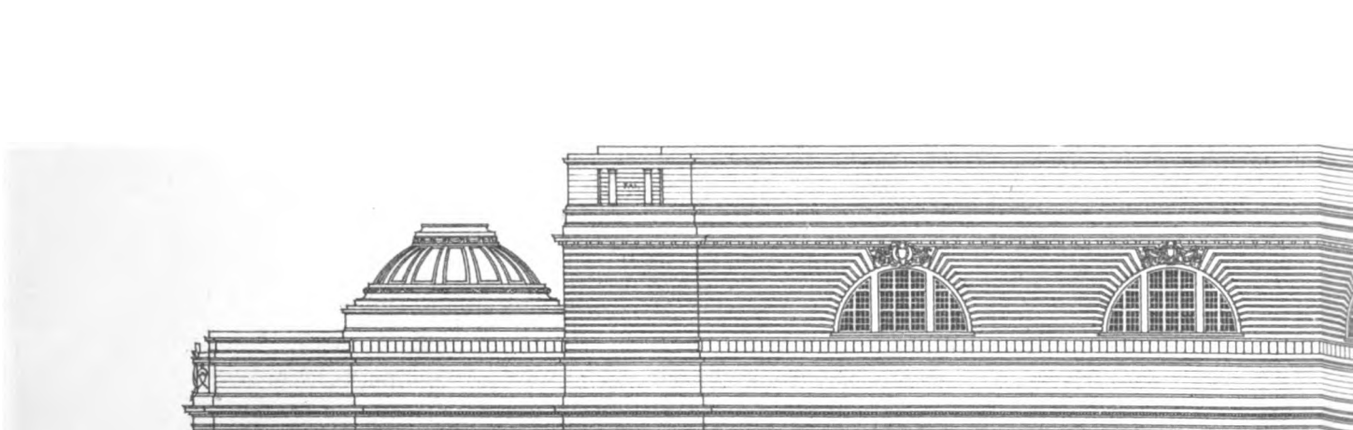
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NATIONAL MUSEUM C



SOUTH ELEVATION.



WEST ELEVATION.

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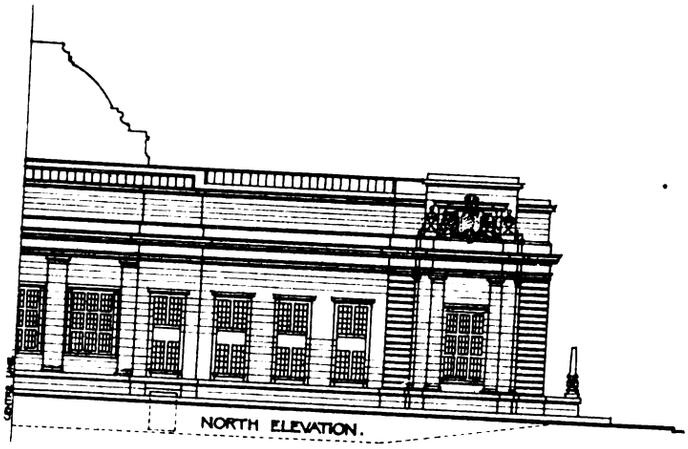
By Mr. JAMES B.

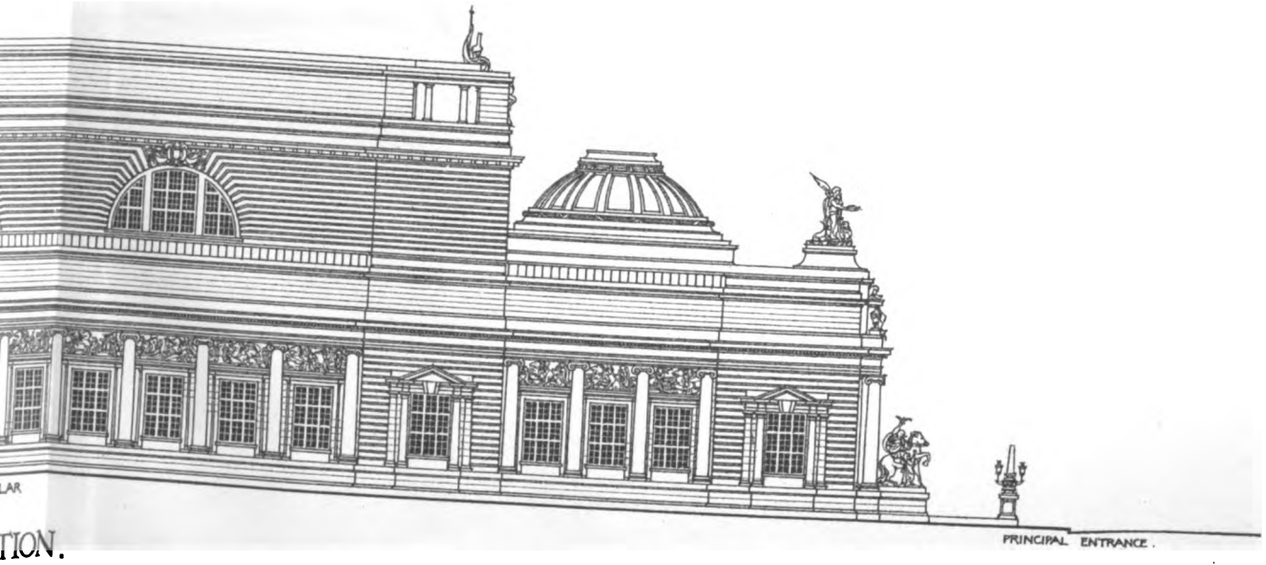
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USEUM OF WALES.



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HE NATIONAL MUSEUM OF WALES.
B. FULTON, A.R.I.B.A.

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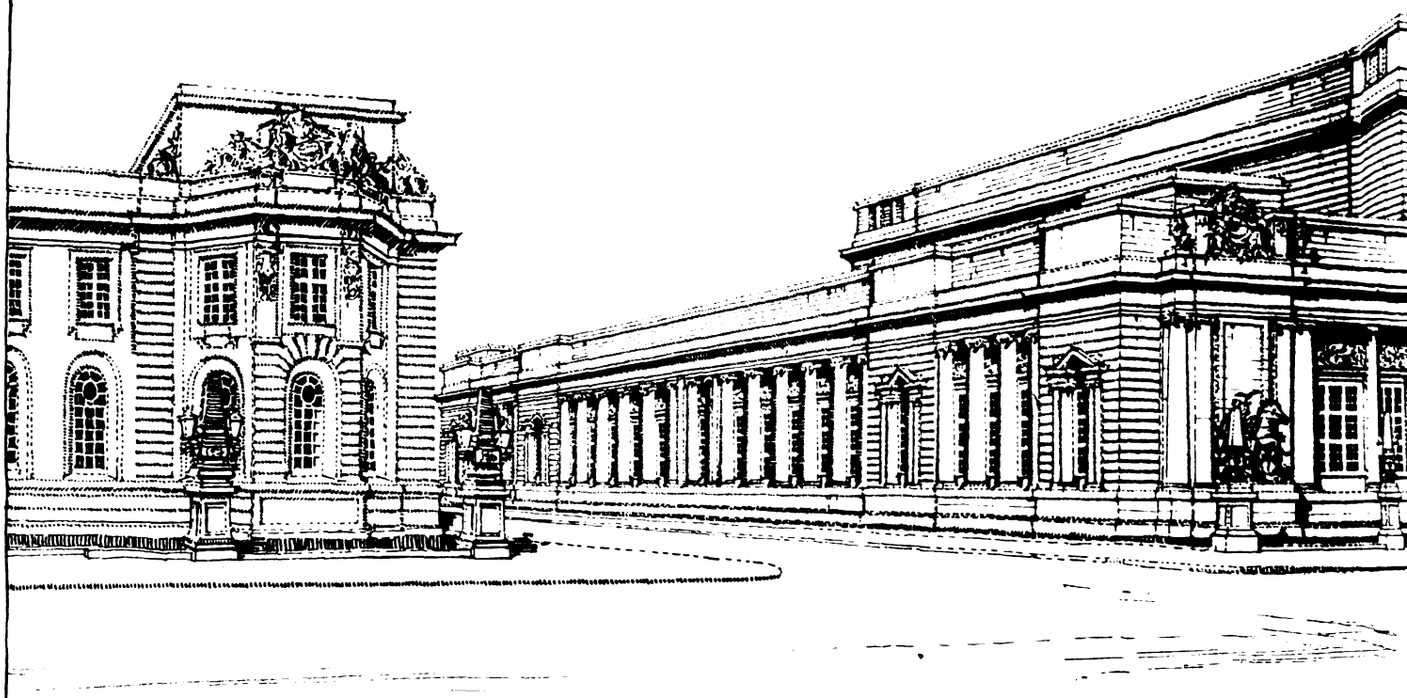
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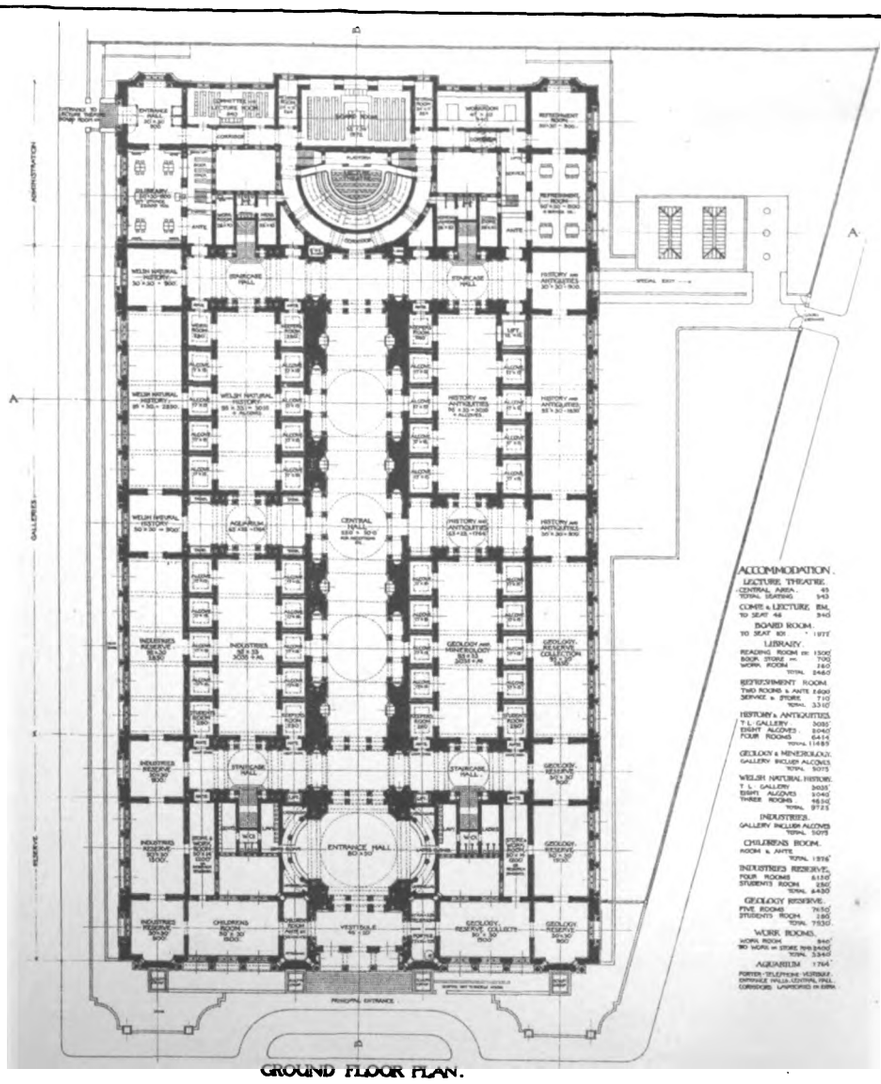
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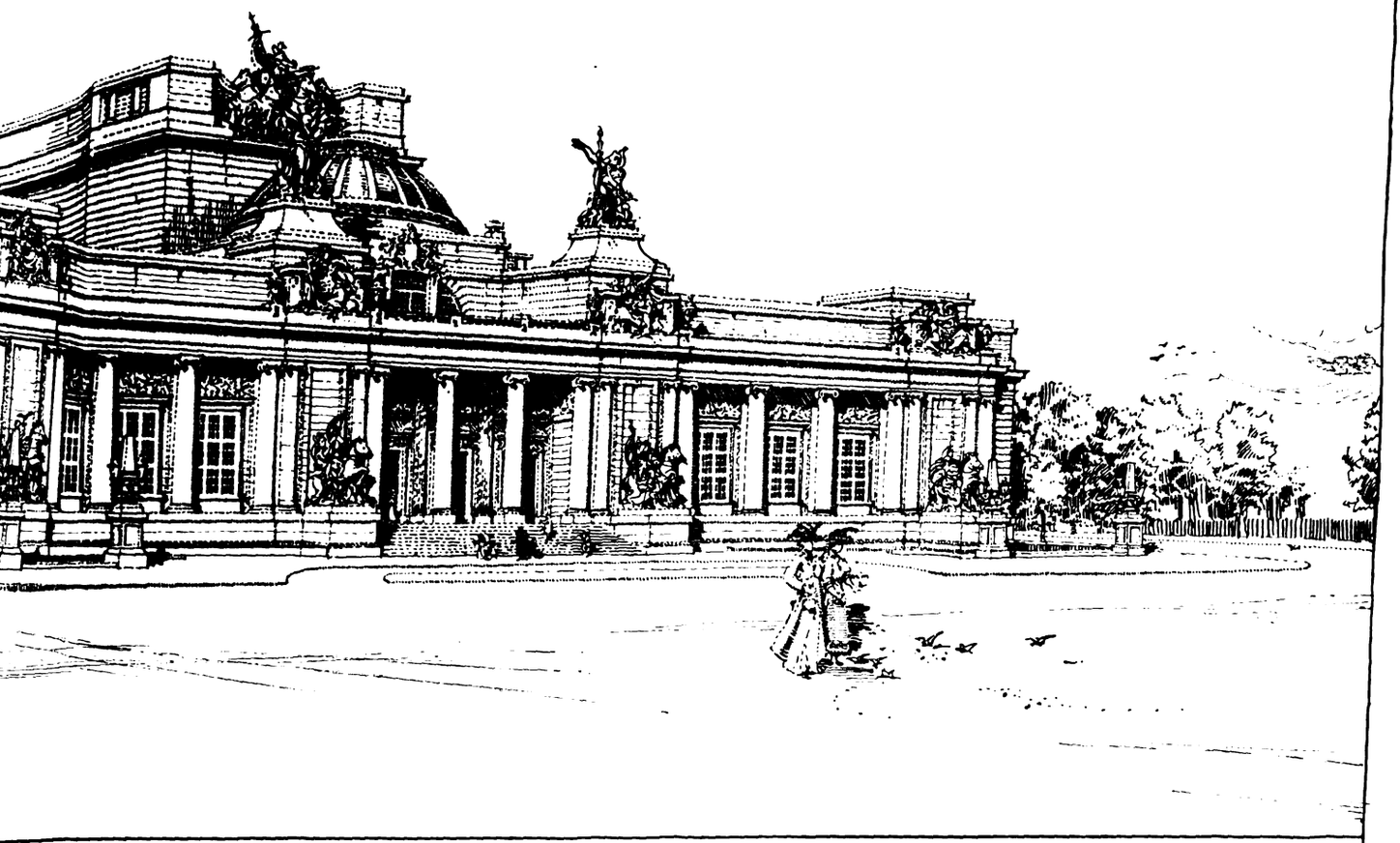


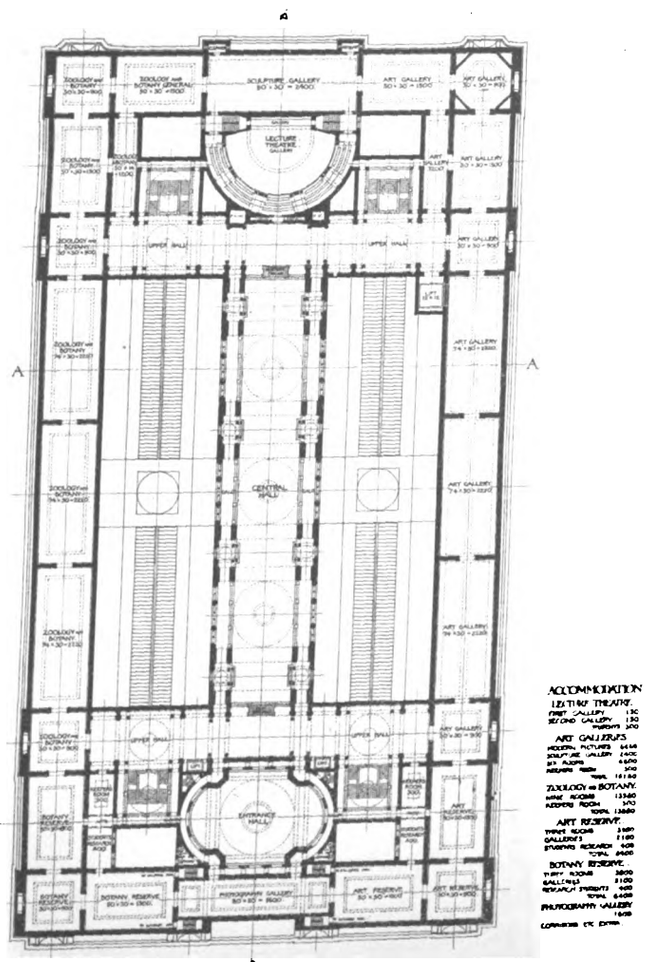
GROUND FLOOR PLAN.

COMPETITION DESIGN FOR THE NAT

By Mr. JAMES B. FULT

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FIRST FLOOR PLAN.

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MODERN COLD STORAGE AND REFRIGERATION.

By W. S. DOUGLAS, B.Sc.

XII.—METHODS OF COOLING.

Comparison of Methods.

THE various methods of cooling and their advocates have always given rise to a vast deal of discussion. Indeed, at one time the newspaper controversies which were waged round this burning question were fierce and of interminable duration. But gradually settled ideas have been evolved, as the result of experiment and experience, and now it is recognised that, for a given set of conditions and for a given temperature, there is only one method of cooling, which can be preferred before any of the others. It is merely round the dividing lines between the spheres of usefulness of each system that opinions are still at times opposed.

It may be broadly stated that for temperatures above freezing a healthy air circulation is essential, and that for those below it is in many cases preferable. The reason for this is that most goods, in a greater or less degree, give off water and other vapours and, with these, finely divided particles of decomposed matter. Add to this the moisture which enters whenever the door is opened, and it will be seen that the air in a cold chamber, if never changed, must gradually accumulate impurities which, if allowed to remain, would completely nullify the preservative effect of the low temperature. Of this fact no proof can be given more convincing than the striking experiment which was carried out many years ago by Mr. Madison Cooper. Mr. Cooper's name, it may be mentioned, is inseparable from this subject, and his articles, which appeared originally in *Ice and Refrigeration* (Chicago) for 1901, have become almost classics. Indeed, they form even at the present day practically the last word on air circulation.

This particular experiment of his was made with a view to ascertaining definitely whether stagnant air had really a bad effect on goods in cold storage. To this end he made a strong case, tin-lined, and filled it with fresh eggs, afterwards nailing down the lid and soldering it so as to be perfectly airtight. The case was placed in a cold store, and for sixty days was maintained at a steady temperature of 45° F. At the end of that time it was opened, and the result, he says, was startling. The eggs were all foul, and moisture was found to have accumulated to such a degree that it was running down all sides of the box. The contents, in fact, were absolutely putrid, and conclusive proof was afforded, if not that air circulation is beneficial, at least that its non-existence is injurious.

Moisture itself, when present in excess, is most harmful to goods in cold storage, but it is rendered even more noxious by its propensity for absorbing almost all the bad gases exhaled from the goods, owing to their affinity for water and also by the fact that its presence favours the propagation of germs. Hence if moisture can be eliminated so can most of the impurities, and this is the secret of the success attending systems involving rapid circulation of air. On this principle, as we know, air is uniformly sucked from all parts of the chamber into some form of cooling apparatus, where it is cooled and whence it is properly distributed, and the result naturally is that in its passage through the cooler the sudden chilling causes a deposit of the moisture, collected from all over the room, in the form of snow. This phenomenon is accounted for, as explained when dealing with ice-cooled chambers, by the increase in hygrometric saturation of the air. Its consequence is that the air rejects with the moisture its attendant impurities, and is rendered comparatively fresh and sweet for return to the chamber.

There is, of course, a certain small residuum of bad gases which cannot be absorbed by, or deposited with, the moisture, but circulates instead round the circuit followed by the air. This must be removed, if the opening of the doors is insufficient, by periodical ventilation.

Below freezing-point the same necessity for a vigorous air circulation does not arise, as at the lower temperatures vaporisation, except with certain classes of goods, practically ceases. In such a case natural gravity circulation from pipes within the chamber would be considered sufficient, although in reality it is anything but uniform. Its actual nature is indicated by the arrows in fig. 35, from which it will be seen that in the middle of the store there is a block of air which scarcely moves. The consequence is that goods in that region, were the system employed for temperatures above 32°, might be discharging vapours and gases, which, instead of being removed by a gentle current of air and discharged in a separate cooler, are allowed to cling round them, to their great detriment. Obviously, therefore, such a system is useless where vaporisation is found.

The most important use of piping within the rooms is for storing frozen beef and mutton. For this purpose it acts very well, as with these meats there is very little vaporisation once the moisture within them has been solidified. The actual freezing, however, should be carried out under air circulation in a separate room, as while it is taking place vapours are freely exuded.

With butter, on the contrary, air circulation must always be employed, in spite of the fact that the storage temperature for this product is never above 32°. This is because butyric germs are continually rising in the chamber, and, were they not removed, would cause a very injurious mould to appear. It follows that we must always have a separate cooler for butter, connected to the storage chambers by suitable passages, in order that the ethers may continually be drawn away and condensed. Only the cold purified air is then discharged into the rooms.

The same remarks may be applied to most fruits, especially pears, which give off quite large quantities of carbon dioxide. Eggs, too, require continuous circulation to maintain the humidity at the right degree. In their case special care should be given to the regulation of the blast, as although it is important that the air should not be too damp, it is also very injurious to allow it to become too dry.

So far, then, we have determined that above 32° we must always have forced air circulation; that below that temperature the circulation must also be forced for goods which "gas," such as fruit and butter, and for eggs, which require a certain exact humidity; but that natural circulation from pipes round the sides of the room is sufficient in the case of frozen meat, especially if the freezing is done in a separate room. This latter clause is important, as if two rooms are employed the store will be, or should be, furthest from the entrance, so that no door from the outside air opens directly upon it, and the only way in is through the room where the freezing is done. In this way no moisture is brought into the room by outside air.

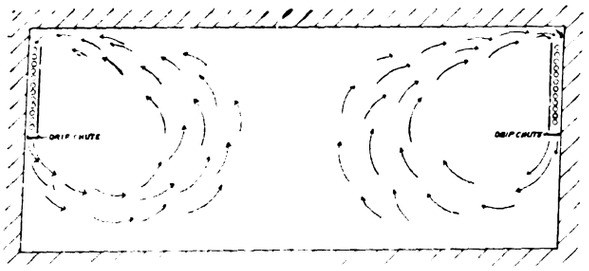


FIG. 35.—NATURAL AIR CIRCULATION WITH WALL PIPING.

It is important that this should be so, and the reason will be easily followed by reference to fig. 35. The circulation, it is obvious, is limited and badly distributed, and while there is little in the middle of the room, it exists, although sluggishly, near the sides. Consequently there is always air impinging on the goods in the vicinity of the walls. But under this arrangement the comparatively very cold brine or direct expansion pipes are on these same walls, and all the time they are extracting heat by radiation from the goods in their neighbourhood as well as from the air which passes over them. It follows that these goods are very cold—much colder than those in the middle—and that as a consequence we have two sets of condensing surfaces, first the pipes themselves, and then the goods. This means that the stuff next the walls, if moisture is allowed to enter the room, or if there is any "gassing," must eventually become permeated with damp, which will cause putrefaction. One way of lessening the evil is to screen the pipes with wooden diaphragms, as shown in the figure, by which means the radiation action is diminished and the circulation increased owing to the greater draught. But even then the system is far from perfect.

This is a disadvantage of direct expansion in the room itself. An objection urged on the other side against air circulation is that the excessive draught causes shrinkage in weight, especially in the case of meat or eggs. Undoubtedly such would be the case if an excessive draught were permitted, but actually, if it exists, there must be some serious fault in the design. The whole object of the separate cooling system is to provide a gentle and uniform circulation from bottom to top of the chambers. If it does not, and if the blast is stronger

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in one place than another, then the trunk areas or the general arrangement must be wrong. Care should be taken to see that they are right, as any variation in the strength of the blast is bad. It not only causes drying up of the goods by rapid evaporation but also prevents the air from keeping its humidity up to standard, both of which defects will lead to shrinkage.

So much for the distinctive uses of the separate air-cooler and piping arranged in the room itself. Our next task must be to decide what we are going to circulate through the tubes, independently of where they are arranged, and the two alternatives before us are circulation of brine or direct expansion of the refrigerating gas. Both of these systems have already been discussed with fair thoroughness, and it will be necessary merely to recapitulate the leading points of each. Direct expansion, it will be recalled, means a higher back pressure (hence increased working economy), combined with low initial outlay, due to the elimination of the evaporator. At the same time it does not permit of absolutely steady cooling, owing to the peculiar intermittent way in which the cooling action sometimes appears, and is also rather difficult to regulate. Brine circulation, on the contrary, allows easy regulation and entirely in tinned copper. Direct expansion is, accordingly, useless for direct cooling.

It also fails for cooling the curing cellars of bacon factories and the holds of ocean-going steamships, for in both these cases the maintenance of an absolutely even temperature is essential. In the former, were it allowed to vary, the "cure" of the bacon would be completely spoilt and its marketable qualities irreparably lost. Also, in these establishments the refrigerating machinery can be kept going only for a certain number of hours per day, and it is therefore necessary to have storage of "cold." Both of these requirements are satisfied by cooling with considerable bulk of brine in galvanised drums, as before described. The drums are not used at sea owing to the space taken up, but brine pipes are placed all round the walls and on the ceiling, where frozen meat is being carried, to ensure the very narrow limit of temperature variation which is often specified by the authorities. Direct expansion has, it is true, been tried for this purpose, but does not give such satisfactory results as brine.

The brine pipes in the holds of steamships act quite well, as the produce is always frozen, but in curing cellars the vaporisation which we have been discussing is continually

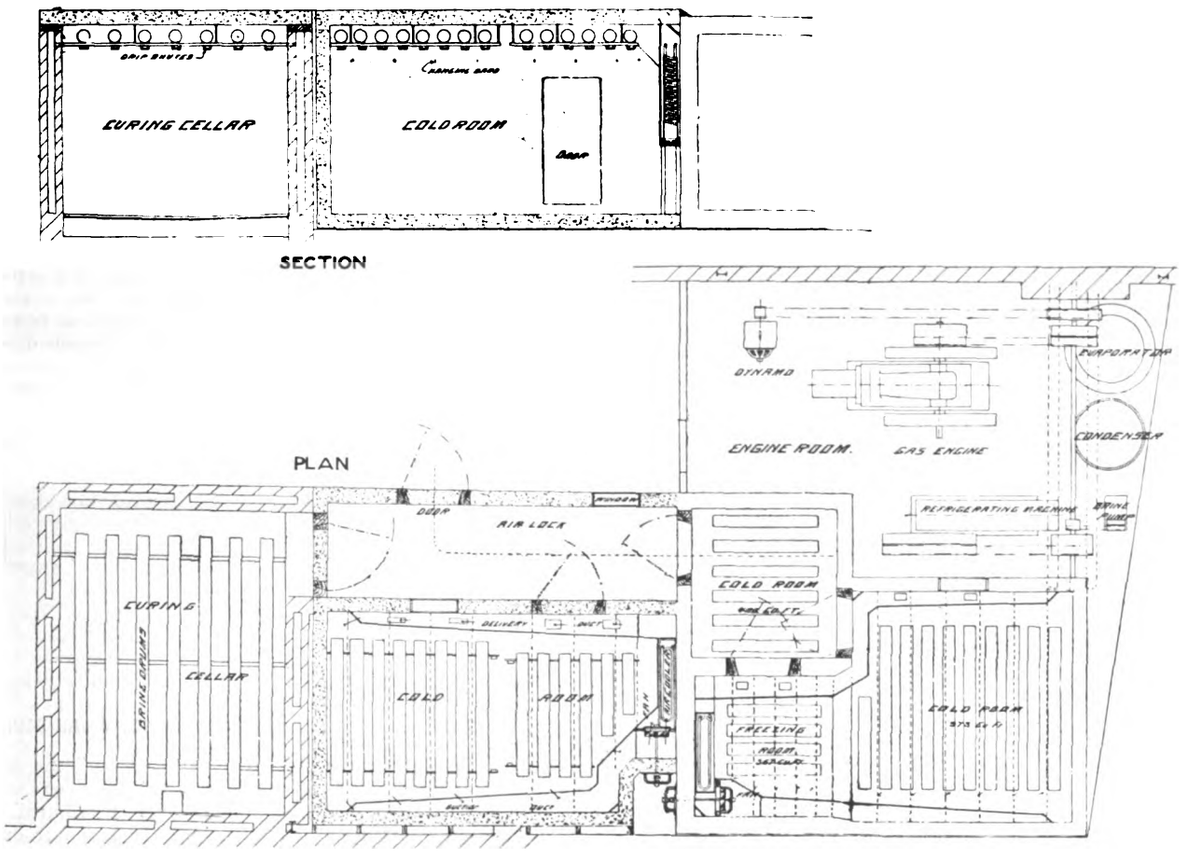


FIG. 36.—COLD STORE COOLED PARTLY BY BRINE AND PARTLY BY AIR CIRCULATION.

tones down the gusts of direct expansion to an average value, while adding considerably to the working costs, owing to low back pressure, and increasing the initial outlay by the addition of an evaporator to the necessary plant.

From the superiority of direct expansion commercially it is at once apparent that we should apply brine circulation only when unavoidable from the circumstances of the case. These circumstances will occur either when the need arises for a perfectly steady temperature or when a liquid is to be cooled direct by flowing over a cooler. In the latter case the apparatus employed (fully described later on) is built up of light copper tubes or mantles corrugated on the outside, over which the liquid to be cooled (wort, yeast, or milk principally) is allowed to flow. Inside the cooler brine is circulated and maintains the required low temperature. The walls are very thin and consequently heat passes through them very readily from the liquid to the brine, but were direct expansion employed they would require to be made of a much stouter construction to stand the penetrating qualities of the various gases used, and in the case of ammonia or carbon dioxide to resist the working pressure (ammonia as a matter of fact is useless in any case owing to its action on gunmetal). This would considerably reduce the efficiency of the cooler and would at the same time add to its cost, made, as it must be for these liquids, taking place, and although its extent is not very great air circulation must be provided except in small cellars, in order to obtain the most perfect results. To this end a separate air cooler, which may be formed of brine pipes connected to the same evaporator as the drums, is arranged, and air is blown over it by a fan in the usual way. We then have all the benefits of air circulation, and at the same time the steady even temperature obtainable only with brine.

This arrangement, in fact, is a most excellent one for all purposes, as the defects of the two systems which it combines are eliminated and only their advantages retained. Unfortunately, however, the initial cost is prohibitive, and consequently your refrigerating manufacturer, when asked to tender in competition, avoids it. Instead he puts in a direct expansion air-cooler for ordinary storage work (this is really very little inferior to the combination system) and brine circulation for the special purposes mentioned.

There are cases, of course, where he is unfettered, and where the design may be perfected as far as possible without regard to expense. The result will be a plant such as that illustrated in fig. 36, which shows a plan view and partial elevation of some cold stores erected in the Midlands. There are four cold rooms, one of which is for freezing, an air lock, and a curing cellar for bacon. The curing cellar is seen on the

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extreme left, and the insulation of the walls, it will be noticed, consists simply of a hollow brick wall with a so-called dead air space in the centre. For the curing temperature (42° F.) this is quite sufficient. The largest chill room is next to the cellar, and is used for removing the remains of the animal heat from the pigs after they have been cooled in the hanging house, also for storing other kinds of meat. Beyond the chill room are three smaller chambers, the smallest of which is used for preserving frozen meat, and the remaining two for freshly killed cattle and sheep.

The curing cellar being small it was not considered necessary to put in an air cooler in addition to the brine drums, but the chill room and two of the cold rooms to the right of the illustration are, as will be seen, fitted with both systems, and accordingly possess the advantages which we have mentioned. In the remaining room the three doors were relied upon to give the required movement to the air at intervals, and this, like the curing cellar, has no special air cooler. All rooms possessing coolers have been fitted, to ensure proper distribution, with trunks, which are suitably tapered as they recede from the circulating fan, and belt-driven fans are included in each case.

The refrigerating machinery is seen in a separate room and scarcely needs explanation. It consists of the compressor with its attendant condenser, evaporator, and brine circulating pump, also gas engine to drive both compressor, pump, and small dynamo. The whole forms a compact plant and is commercially a success, being used not only by the owner but by his fellow tradesmen as well. So busy indeed is he, that fruit, vegetables and oddments are stored in the air lock.

OBITUARY NOTICE.

MR. HENRY SPALDING, F.R.I.B.A., passed away at his residence in Hampstead on Saturday, June 25, after a few days illness from acute pneumonia.

He was in the seventy-second year of his age, and had been in practice over forty years, joining the Royal Institute of British Architects in 1873. Among the many public buildings carried out in conjunction with his partners the following may be mentioned:—The Municipal School of Technology, Manchester; the Workmen's Dwellings, Manchester; Public Baths at Hampstead, Dulwich, Camberwell, Wandsworth, Westminster, Shoreditch, Coventry, &c.; schools at Berkhamsted, Luton, Stockport, &c.; the Village Homes for Boys, Swanley, and additions to the Homes at Farningham; offices for the London Missionary Society, the London City Mission, the Imperial Tobacco Co., and other private firms; churches and schools at Hampstead, West Hampstead, Cricklewood, Harlesden, East Finchley, Barnet, Hither Green; residences at Hampstead for the late Judge Waddy, the late Judge Bompas, and many others.

Eleven years ago he took his son, Mr. Reginald H. Spalding, A.R.I.B.A., into partnership, and he will continue to carry on the practice.

TOWN PLANNING IN THE LIGHT OF THE HOUSING, TOWN PLANNING, &c., ACT, 1909.*

MANY of us engaged in the administration of Acts of Parliament, by-laws as to new streets and buildings, &c., have long desired to see some such measure as that which has recently become law by the foresight and intimate knowledge of local requirements (if one may be allowed respectfully to say so) of the President of the Local Government Board.

In order to appreciate the benefits conferred by the new Act, it is desirable to first consider the limitations that local authorities have hitherto suffered from in regard to matters that come within the scope of the Act or that are related thereto.

Apart from the subject of the number of houses to be built per acre, the allocation of sites for various purposes, open spaces, &c., there has been a difficulty in controlling the laying out and construction of new streets, except under the hard and fast rules of local by-laws. Some towns there are having by-laws permissive as to the width and mode of construction of new streets, but this is quite exceptional, and the great majority of urban and rural districts have by-laws definitely prescribing not only the width of the streets, but the portions to be allocated to carriageway and footways. The Local Government Board do not, as a general rule, sanction by-laws of a permissive nature, if penalties attach to the non-observance thereof; and no doubt this is a necessary precaution in certain cases where a local authority, on the one hand, might demand a width of street in excess of the requirements of the circumstances, or, on the other hand, might even allow a favoured landowner to lay out streets so narrow as to overcrowd his land with houses.

Great damage has been done to many districts by the insufficiency of power to control the laying out of new streets and the erection of buildings abutting upon existing highways without causing such streets to be widened, with the result that our main lines of through communication are often exceedingly narrow, instead of being, as they ought to be—and might have been—good wide roads with improved gradients. These evils, which might have been avoided had the power existed to prevent them from arising, can now only be remedied at great cost. Preventive means are to some extent afforded by section 150 of the Public Health Act, 1875, but in many rural districts which have not adopted this section there has not been the power, while in urban districts and rural districts having the power there is sometimes a regrettable lack of foresight and desire to improve the old narrow highways passing through land as yet undeveloped for building purposes; consequently when the time has come for development houses have been allowed to be built right up to the street line, greatly to the detriment not only of the district itself, but of a more important district adjoining, to which this old and narrow country road is probably the most direct means of communication from another largely populated centre of industry, or which forms a portion of a circumferential or ring road, making cross connection with the radial roads. The Town Planning Act, by enabling either the local authority or landowner to prepare a scheme, overcomes some of these difficulties, and although the process may cause a certain amount of delay there is the power.

The question of the width of new streets is always a difficult one from a by-law point of view. To whom shall power be given? The maximum width under the average street by-laws is too small—generally 50, 42, 40, or even 36 feet. The author, however, is of opinion that the Local Government Board might well sanction, for some of the larger towns, by-laws permitting of greater latitude as to street widths. He has had the honour for over fifteen years of acting as engineer and surveyor in towns (Dover and Birmingham) where the by-laws permit of the variation of the widths of streets, and he can honestly say that the privilege has never been abused or sought to be abused by the local authority or any landowner. In the latter city, of which it pleased his late Most Gracious Majesty King Edward VII. so recently as July last to say, "Birmingham is the home of the best traditions of municipal life"—a gracious and priceless expression, which we shall ever treasure and endeavour to continue to deserve—the by-lays prescribe a width of 50 feet for any new street which is to be laid out as a carriage road, the Council having power to reduce the width in any case in which an open space shall be left along one or both sides of any new street throughout its whole length in front of the houses, or in which any new street shall not be the principal or only approach to the dwelling-houses. The Council have framed regulations for their guidance in this matter, and after considering the merits of each application for a reduction of width they determine whether the street shall be 42 feet or 36 feet wide. The width of the carriageway and of the footways is at the option of the Council, and their usual practice is to prescribe for a 50-foot street a carriageway of 32 feet and two 9-foot footpaths; for a 42-foot street a 26-foot carriageway and two 8-foot footpaths; and for a 36-foot street a 24-foot carriageway and two 6-foot footpaths. It would be a hardship, and perhaps an injustice, to ask a landowner to construct street works of a greater width than about 50 feet, but in the case of an important main street through a new estate he might well be asked to give up sufficient land to make the street say 80 feet or 100 feet or such other width as the circumstances might determine, provided that he contributed to the cost of street works of a width of 42 feet only.

As a general rule, except in the case of main thoroughfares or tramway routes, it is more important to get an increased space between the building lines than between the forecourt fences, thus securing a wider passage for air between the fronts of the houses; and in the case of main thoroughfares the local authority should have discretion in allocating the respective widths of carriageway, footways, and unpaved or unmetalled portions. From a financial point of view, too, it would be cheaper for the local authority and the landowner, because the former would have less road surface to maintain, and the landowner would have less street works to execute,

* A paper read before the Incorporated Association of Municipal and County Engineers, at the thirty-seventh annual meeting held at Plymouth June 16-18, by Henry E. Stilgoe, M.Inst.C.E., city engineer of Birmingham.

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the cost of which works is often greater than the value of the land. Therefore if local authorities could make by-laws (subject to the approval of the Local Government Board) by which they could define the building lines in new streets and have discretion as to the disposal of the width of the street, great advances would be made in improving the health of the community, and in improving the appearance of our streets. These powers are most urgently required.

It may be interesting to note to what extent local authorities already possess such powers. A very few local authorities have special Acts of Parliament dealing with frontage and building lines. Birmingham has two Acts conferring special powers as to street and buildings. The following are important provisions:—

The Corporation may from time to time widen, straighten, turn, alter, and improve the streets, and may acquire by agreement any premises necessary for the purposes of this section of the Act.

The Corporation may require every person who erects any new building, in or fronting any street for the time being laid out or used as a carriage road, to erect the building to be so erected at the distance of 7 yards at least from the centre of such street, the said space or distance of 7 yards to be given up and form part of the said street unless the written consent of the Corporation to the contrary be obtained by such person. The Corporation to pay compensation for any loss or damage which the owner or other person may sustain in consequence.

The Corporation may prescribe a frontage line in streets which are narrow or inconvenient, or without any sufficiently regular line of frontage or where it is necessary or desirable that the line of frontage should be altered. In such cases the Corporation may, and if required by the owner shall, purchase the land for the time being unbuilt upon lying between any such prescribed line and the street or road, the same to form part of the street.

The Liverpool Corporation (Streets and Buildings) Act, 1908, confers special powers upon that city in regard to streets and buildings, some of the principal of which are the following:—

Power to require estate plans to be submitted before any work is commenced, showing the method of laying out the whole of an estate proposed to be developed and not a street only.

The provision of wide roads up to 80 feet in width where required for main roads.

Reduced street works may be allowed where open spaces are given beyond by-law requirements.

To define centre lines of streets and powers to require owners to set back to the prescribed distance from such centre line when building on one side of the street only. To set buildings back an additional one-tenth of the width of the street from the line of street. Intersecting streets to be laid out at every 150 yards. Powers to adjust and alter irregular boundaries of building estates.

The immediate pulling down and setting back of existing property if required on payment of compensation.

These instances are quite exceptional, and the author considers that such powers should be more widely conferred. As regards a local authority's control of the direction of new streets, an important advance is made by the Public Health Acts Amendment Act, 1907. By section 17 the local authority may, on the deposit of a plan and sections of a new street in pursuance of a by-law in force in the district, by order vary the intended position, direction, or termination or level of the new street so far as is necessary for the purpose of securing more direct, easier, or more convenient means of communication with any other street or intended street, or for the purpose of securing an adequate opening at either end of the new street, or of securing compliance with any enactment or by-law in force in the district for the regulation of streets and buildings. The local authority to pay compensation to any person injuriously affected by the exercise by the local authority of their powers under this section. This is an adoptive Act. Section 17 is particularly useful, and would be more so if it were compulsory.

Having called attention to some of the hindrances to the better planning and improvement of our towns, and which might, one would think, be removed to the injury of no one, but rather to the great good of all concerned, we will consider what the town planning portion of the Housing and Town Planning Act will do for us.

Sections 43 and 44, although placed under Part I. (Housing of the Working Classes), have a distinct and useful bearing on Part II. (Town Planning).

Section 43 prohibits the erection of back-to-back houses intended to be used as dwellings for the working classes; this is very important, and particularly so if it is to apply also to dwelling-houses which can now be erected under by-laws which do not prescribe that the minimum air space to be provided thereunder at the rear of the house shall extend "laterally throughout the entire width of such dwelling-house." Under such by-laws dwelling-houses can be built partially back-to-back, and in such a manner that the air is merely in a well-hole and cannot circulate. The author would like to see the section amended so as to apply to all dwelling-houses.

Section 44 gives power to the Local Government Board, after local inquiry or otherwise, to revoke any by-laws with respect to new streets or buildings which may unreasonably impede the erection of dwellings for the working classes. It is assumed that this section is intended to be used chiefly in cases where it is proposed to erect dwellings on sites which have been cleared of houses, and where, to enforce the full provisions of the by-laws in respect of the width, &c., of streets, or in respect of air-space, would cause great hardship to the owner of the property, and unnecessarily reduce the number of houses in a locality where they might be specially required. Its provisions as to new streets may be useful also in the development of garden cities, but the Board will, no doubt, take care that the revocation does not cast an increased burden upon the local authorities.

Part II. (Town Planning) opens with the very wide and comprehensive section 54, which enacts that a town planning scheme may be made in accordance with the provisions of this part of this Act as respects any land which is in course of development or appears likely to be used for building purposes, with the general object of securing proper sanitary conditions, amenity, and convenience in connection with the laying out and use of the land, and of any neighbouring lands.

The Local Government Board may authorise a local authority to prepare a town planning scheme with reference to any land *within or in the neighbourhood of their area*, or may authorise a local authority to adopt, with or without any modifications, any such scheme proposed by all or any of the owners of any land with respect to which the local authority might themselves have been authorised to prepare a scheme. This appears to make it possible for a local authority to adopt a scheme prepared by owners of land in respect of land in the neighbourhood of their area. Every scheme is to be subject to the approval of the Local Government Board. On an objection being lodged in the prescribed manner, either House of Parliament may present an address to His Majesty against the draft of the order. A town planning scheme, when approved by the Local Government Board, has effect as if it were enacted in the Act, and it may be varied or revoked by a subsequent scheme, similarly approved.

Under section 58 any person whose property is injuriously affected by the making of a town planning scheme shall, if he makes a claim, as prescribed, be entitled to obtain compensation in respect thereof from the "responsible authority" (being the local authority responsible for enforcing the observance of the scheme—see section 55). That is to say, a person thus injured can claim from the authority responsible for a scheme in an adjoining district. This would appear to be somewhat illogical, as a local authority—unless stirred up by the Local Government Board under section 61—might shirk its duty at the expense of the "responsible" (neighbouring) "authority." It is well that this point should be appreciated, because it is a justification for the plea that a local authority which is a hindrance to the progress and a menace to the health and well-being of an adjoining local authority, should no longer have a separate existence from that authority. This section further provides against compensation being obtained for anything done (except works of completing something previously commenced) with respect to land included in a scheme after the time at which the application for authority to prepare the scheme was made, or after such other time as the Local Government Board may fix for the purpose, and it provides also for betterment.

Section 59 excludes compensation in respect of such provisions as would have been enforceable "if they had been contained in by-laws made by the local authority." The words here quoted are somewhat difficult of understanding by the lay mind. Read as they stand, they imply that the Local Government Board shall settle whether the provisions are such as the Board would allow the local authority to make into by-laws. The section also excludes compensation in respect of any provisions as to the space about buildings, the number, height, or character of the buildings to be erected, such provisions being inserted with a view to securing the amenity of the area included in the scheme. The amount of compensation in certain cases is limited; where a person is

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entitled to compensation under this part of the Act, and he would be entitled to compensation in respect of the same thing under any other Act, he is not entitled to compensation in respect of the same thing under this Act and under the other Act; and he is not entitled to any greater compensation under this Act than he would be under the other Act. This section thus protects the responsible authority against liability to compensation in respect of inordinate claims by the landowner, and makes the Local Government Board the authority to say what is necessary in each case for securing the amenity of the area.

It is therefore possible, without a local authority having to incur cost for compensation, to prevent every acre of land from being covered with as many houses as can be squeezed in under the building by-laws there in force.

Section 60 gives power to the responsible authority to purchase, by agreement or compulsorily, any land comprised in a town planning scheme. Similarly, a local authority not being the responsible authority, may purchase land comprised in a town planning scheme within their area.

In certain cases a local authority might desire to purchase the land and take advantage of the entire benefits of the scheme.

Under section 65 the expression "local authority" means the council of any borough or urban or rural district.

Any expenses incurred by a local authority under this part of the Act shall be defrayed as expenses of the authority under the Public Health Acts, and the authority may borrow money therefor in the same manner, &c., as for the purposes of the Public Health Acts. Such money borrowed is not to be reckoned as part of the debt of a borough or urban district for the purposes of the limitation on borrowing under the Public Health Act, 1875, section 234, sub-sections (2) and (3).

The fourth schedule to the Act contains under its nineteen heads a very comprehensive list of matters and things in respect of which the Local Government Board may prescribe general provisions under section 55. The same section gives the fullest power in the matter of making general provisions in respect of a scheme, and for suspending, so far as necessary for the proper carrying out of the scheme, any statutory enactments, by-laws, regulations, or other provisions, under whatever authority made, which are in operation in the area included in the scheme.

The Act generally is so widely drafted that it may be said to cover every point that can reasonably be foreseen at so early a stage of the town planning movement; and it foreshadows a desire for a conciliatory attitude between the authorities and the landowners, which attitude, if persevered in throughout the negotiations, will, the author feels certain, have a most beneficial effect, not only in obtaining better results, but in fostering a spirit of co-operation.

The Act is useful, not only actually but potentially, for the fact that it exists, and can be put into operation, will no doubt often assist a local authority to get many minor improvements effected without the necessity of preparing a scheme.

Being in a position to obtain powers, we can now get to work in preparing a town planning scheme if one is required. What is the best work that we can do? In what direction shall we turn our atention? The answers to these questions must be various. Every locality must be treated in accordance with its particular requirements.

In the case of a scheme dealing with main thoroughfares, the first thing to do is to gain an intimate knowledge of the district by studying it on the ground and by means of maps, and to watch its traffic, taking particulars of the direction it takes, whether it is through or local, &c. It will often be found that through traffic having no calls to make in the town, would avoid the heavily trafficked streets of the centre if it could get round; this is particularly true of fast-moving traffic, such as motor-cars, and of traction engines, heavy motor vehicles, &c. If circumferential or ring roads were made round large towns they would be the means of linking up the radial roads, thereby giving direct access to the several parts of the town, of opening up and giving access by tramways or otherwise to the suburbs, and of developing land and thus bringing in additional rateable value. The radial roads themselves may want improving.

The author is a great believer in making the main roads as wide and as noble in appearance as the circumstances of the individual locality may require. Such roads are not only necessary for vehicular traffic, but they are a delight to the eye, and assist in promoting health. What more beautiful sight in a town street (or any other street) than a fine avenue of trees in a good wide road, embellished with plantations of shrubs, grass-plots, and the like, with here and there a fountain or some other pleasant thing! Such a street enhances the rateable value of the property and serves as a promenade, where something better may be thought of than the ceaseless wandering up and down of a gaping, jostling crowd, such as may be seen in many of our streets at night. Give the people reasonable and proper means of healthy lines of thought and they will take advantage of them. What better facilities could there be than in walking out, or, in summertime, taking a ride on the top of a tramcar under the conditions spoken of?

The desirability of constructing wide streets or boulevards on town planning lines is not a new one in this country, and it was strongly urged by Mr. James Newlands, borough engineer, in his report to the Health Committee of the Borough of Liverpool in the year 1848.

The author will make no apology for quoting the portion of Mr. Newland's report *in extenso*, for it is only due to this eminent gentleman, who did such good work in Liverpool, that his views should be more widely known. He says:—"While it is necessary to attend to the width and proper direction of streets, it is no less essential to provide places of recreation, where may be enjoyed the elasticity of spirit produced by fresh air and cheerful prospects. Liverpool can boast of two places of great beauty—the Prince's Park and the Botanical Gardens; but these inadequately fulfil the purpose pointed at. And while I admit their importance, their isolation interferes with their enjoyment; and for other reasons I must place them and public parks in general in a sanitary view below public promenades, like the boulevards of the Continental cities, and which no city in the Empire has such facilities for forming as Liverpool. A spacious promenade with a carriage road carried round the town nearly on the boundary line of the borough, with roads and streets radiating to it, would be accessible alike from all parts of the town. Planted with trees and adorned with fountains and works of art, commanding views of the various beauties of the environs, with glimpses at intervals of the sea, the river, the Cheshire coast, and the distant mountains of Wales—such a promenade would possess endless attractions. At once could the labourer, immured all day in the town, emerge from its smoke and bustle and noise, and with his family enjoy his evening walk amongst the beauties of nature, and be invigorated by the pure air of heaven. Such enjoyments would empty the ale benches, and elevate the moral conditions of the people. It is obvious, however, that although such a plan may at the present moment be suggested, it could not be detailed, unless under the authority of an Act of Parliament to make the necessary purchases, lest the machinations of land speculators should render the project abortive."

The spirit of Mr. Newlands is revived in Mr. John A. Brodie, the present City Engineer of Liverpool, who is now carrying out work on the lines referred to.

In planning the rural portion of the area of a town the building development should not be allowed to take place as an overflow on the edges, as it were, without any thought of how the traffic is eventually going to find its way among the houses, but there should be a broad policy of main roads projected into the heart of the undeveloped land, so as to open it out and bring the country nearer to the town, or the town to the country; these may be called the radial roads, and they should be linked up by a carefully planned system of circumferential roads. With these roads comes the consideration of means of conveyance, and it will be conceded that people of the working-classes and others, who do not desire to cycle and who cannot afford private carriages, will not live four or five miles or more from their work unless there is a rapid and cheap means of transit to and fro. The electric tramcar, where no sufficient train service exists, will meet the necessity, and will enable people working in the great centres of industry to have their homes in the suburbs. In fact, the means of transit is the prime factor in bringing lands into building value, and when it is urged that owners cannot possibly sell or cut up land for building purposes if they can only erect thereon ten or twelve small houses per acre, let it be remembered that it does not become building land until it is developed from within—that is to say, until the urban expands into the rural—and that it is much better to convert several acres of what is perhaps not too profitable agricultural land into building land, even if the area is more sparsely covered with bricks and mortar than one habitually sees in the working-class areas.

The restriction in the number of houses per acre need not interfere with the legitimate business of the speculative builder, who has done good work, and been the means of providing good and cheap houses for the working-classes. He will be able to obtain the land at a less price than heretofore.

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MODERN EUROPEAN ARCHITECTURE.

GERMANY.



[From *Der Prof nbau*

A BLOCK OF FLATS IN CAMPHAUSENER STRASSE, BERLIN.—Herr FRIEDRICH BLUME, Architect.

In laying out main roads, may the author enter the plea that if of any considerable length, they be given a gentle bend or curve here and there, just to present a new vista? There is nothing so tiring as to walk for a mile or so along a straight road, where there is nothing to break the monotony. The suggested bends in the roads will hardly vary the length of the route, but they will be such as to change the view and to show off to advantage some piece of architecture, a group of trees, or other object, as one approaches it.

It is not here necessary to go into the details of how the width of the main streets may be allocated to carriageway and footways, to grass plots, plantations, and the like, or how they are to be embellished and beautified. If we admit the principle of the main streets and cross streets therewith at sufficient intervals, the development of the intermediate or adjoining land will follow as a matter of course. Open up the country by all means. Whereas it is a necessity that the local authority should take in hand the question of the arterial roads, the landowners may well be left to settle the details of their own estates, subject, of course, to restrictions as to the number of houses per acre for each area, and to such helpful regulations as to the height and character of buildings, and the protection from depreciation of value of the amenity of the estate by reason of what an adjoining owner might do if uncontrolled. Each district to be dealt with must be treated according to the local requirements, to the class of people likely to reside there, and in accordance with its physical conditions; there are, however, some guiding principles which are always applicable. Take advantage of aspect, make use of all natural objects of beauty, lay out the roads so that existing trees may come in the grass margins or in the forecourts of the houses. It is as easy to make a place pretty as it is to make it ugly. Why the long rows of buildings—the monotony of their want of architecture relieved no more than is a stack of bricks—crowded together on the very edge of the street? Their back premises often had better not be visited! How can people condemned to live in some of the slums that exist be expected to bring up their families in decency? The author does not here refer to the slum-dweller "by desire"—of whom unhappily there are many.

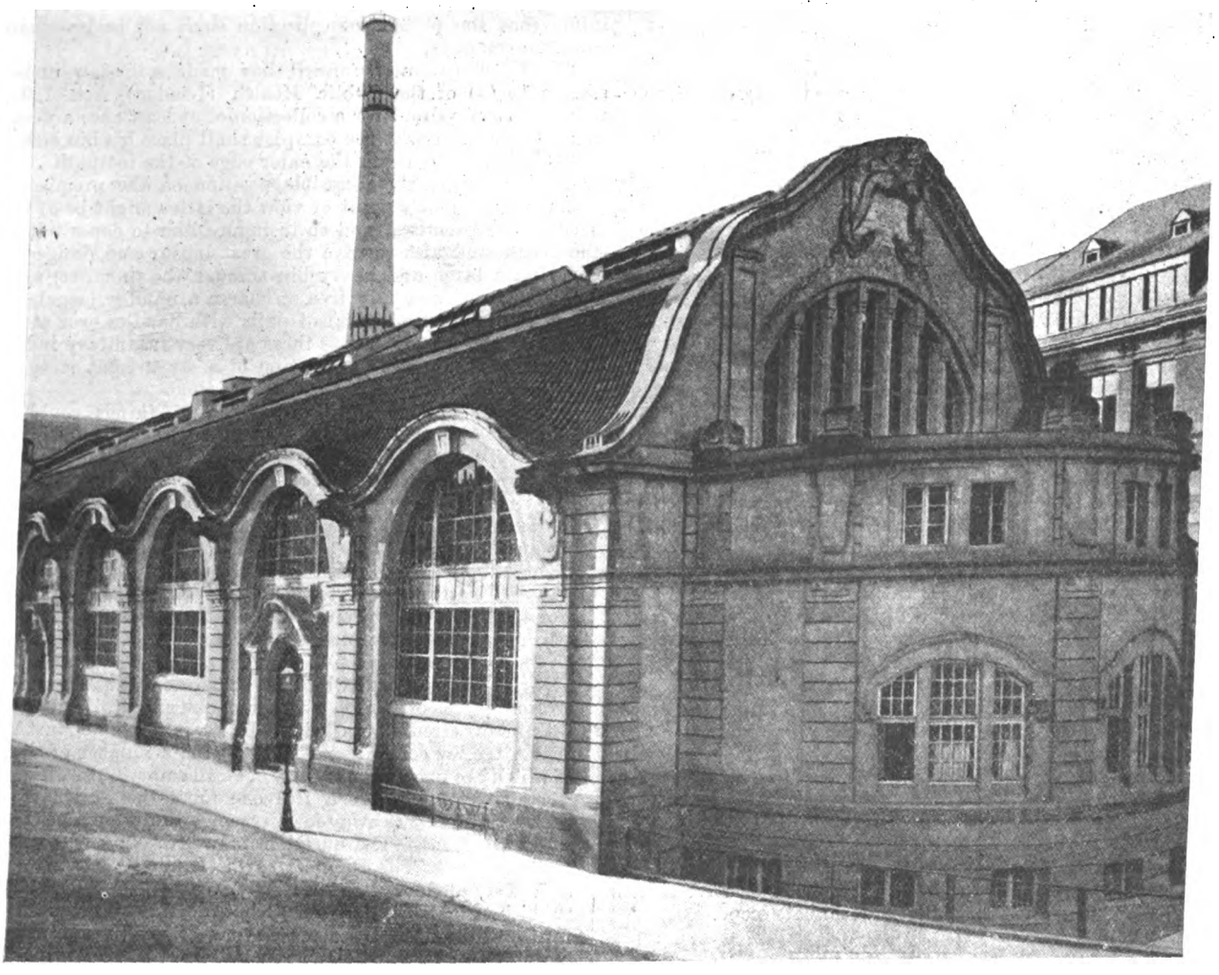
In all residential streets, it may be taken as an axiom that the property will be greatly advanced in value if the houses are set well back from the side of the street.

In laying out subsidiary streets, where the intended houses are to be for the artisan class, and where the streets do not carry heavy through traffic, the width of the carriageway can be reduced in favour of the provision of grass plots or of wider footways, not necessarily to be paved for the full width, and thus save expense to the person laying out the estate. The local authority in granting this concession should do so on the condition of the houses being well set back. The tenants will take a pride in keeping their front gardens in nice order, even if they do not do much gardening at the back, and in this respect—as all men are not

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MODERN EUROPEAN ARCHITECTURE.

GERMANY.



[From *Der Profanbau.*

MACHINERY HALL OF TECHNICAL HIGH SCHOOL, DARMSTADT.—Geheimrat Professor WICKOP, Architect.

gardeners—it is best to have the back gardens so arranged that some have more area than others; also that there be a good plot for allotments, so that the men can converse, work side by side, and promote a healthy rivalry. There should be strict rules against covering backyards of limited area with poultry runs, rabbit hutches, and the like.

In the model village worked on co-partnership or sole proprietorship lines it is best to have a head man or resident agent, whose duty it is to bring offending tenants to book, if they disregard the rules made for the well-being of the colony.

The author has referred to the "centres of industry," and the expression must be regarded in the sense in which we generally know it, for most of our towns have grown round the centre of the industrial life. Under the Housing, Town Planning, &c., Act it is possible to allocate land for certain purposes, and it is conceivable that in some town planning schemes portions will be reserved as sites for factories, &c. This consideration may, as a rule, be allowed to take care of itself, as large works are not likely to be established unless there are near at hand railway, canal, or other means of transit for goods. The more general use of the powers of the Act in this respect will probably be to prevent undesirable factories from being erected to the annoyance of persons in a residential area.

With regard to open spaces; apart from the public parks and playing fields which are such an immense benefit, the author is of opinion that squares laid out in the midst of working-class property would be a great boon; the children could play there under the maternal eye, without having to resort to the streets or to walk long distances to get to a park. These squares could either be private and be laid out as an amalgamation of the back gardens—leaving sufficient paved yard fenced off to each house—or they could be laid out as public places under the care of the local authority. They should have an entrance from the street on each side of the square, and the same should be locked up at dusk.

As previously stated, there is no general rule; we must be content to go quietly in these matters. Treat landowners with consideration, and approach them in a proper manner, and we shall attain much more than if we are aggressive and attempt to lay down the law. Let them have a word in the laying out of their own property, and show them the benefits of co-operation. Englishmen do not like being told what they *are* to do; it goes against the grain.

For some months the author has been considering the best means of laying out and developing a rural area of over 1,000 acres on the western side and within the city of Birmingham. Immediately the greater portion of this area came into the city, and before the passing of the Act, he asked the landowners to meet him and discuss a scheme by which arterial roads might be laid out, so as to serve all the estates concerned. The meeting was a great success, and the owners promised their co-operation. The next step taken was to apply to the Local Government Board for a loan of 10,000*l.* for laying intercepting sewers in the area. In addition to this a committee has been appointed to consider the preparation of a town planning scheme. First consideration will be given to the arterial roads, and it is hoped and believed that by the provision of these, the landowners will appreciate that their estates will be developed rapidly.

In devising any town planning scheme it will be necessary to carefully consider the financial aspect from a public as well as a private point of view, and it must be remembered that the construction of main roads, the laying of main sewers and gas and water mains, and the construction of tramways, &c., are all expensive works, most of the cost of which would have to be incurred in serving a small population equally with a large one. We must not therefore be too

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sentimental or unpractical. The money spent on wide main roads before the frontages are developed will certainly yield a good rental for the outlay; and we are informed that well-managed estates laid out on the garden city principle with twelve houses per acre pay a fair interest on the expenditure. In the latter case all depends on the rents charged, and if it can be done with rents at 6*s.* 6*d.* per week, it is a step in the right direction. On two estates in Birmingham where the houses are let at 6*s.* 9*d.* per week, there are twenty houses to the acre, built in terraces of four, six, or twelve, at a cost of less than 160*l.* per house. The land is leasehold for ninety-nine years at an annual ground rent of 2*l.* 5*s.* to 2*l.* 10*s.* The building plots have a frontage of 5 yards, and are from 40 to 45 yards in depth; the houses are set back 10 feet from the side of the roads, which are 42 feet in width, constructed in the best manner, and having a 26-foot carriageway and two 8-foot footpaths paved with concrete flags, and having granite kerbs and channels. The accommodation is, on the ground floor, a hall entrance 2 feet 9 inches wide, a sitting-room 11 feet 6 inches by 11 feet with bay window, a kitchen or living room 14 feet by 13 feet, scullery 11 feet by 8 feet, pantry 5 feet by 3 feet, coal-house, w.c., and ash-bin house; on the first floor, two bedrooms 14 feet by 11 feet 6 inches and 13 feet by 11 feet respectively, and a bedroom 14 feet by 8 feet, with a bathroom and airing closet therein. The houses are well built and can be purchased for 160*l.* each; they are occupied as quickly as completed. The sites are close to a tram route, the fare on which is 2*d.* to the centre of the city, about 3¼ miles distant, and there is a penny stage about 1½ miles distant, where many of the residents work.

There are numerous minor, but very important, items of improvements to streets and buildings, which may be carried out under the Act, but they cannot be referred to within the scope of this paper.

Before closing this paper the author would like to call attention to a fact that is often overlooked, namely, the great debt we owe to the owners of large estates, who have in many instances in the past laid out their land in such a manner as to preserve the amenity of some of our most beautiful suburbs in a most remarkable way. It is their misfortune that hitherto the local authorities have not had the power to control the use of the land adjoining.

The Act appears to be a common sense and an equitable one and should be very carefully studied by all executive officers who have to deal with the subjects within its scope.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Ashbins versus Ashpits.

SIR,—When your correspondent "Cleanliness" asks what is the best system for "removing house refuse," I presume he means the best method of storing it prior to removal, as the former is a matter for the local authority, while the latter appears to be the point he is most concerned with. The question of whether the bin or the ashpit is best, even under "practical" conditions, is quite a matter of local circumstances.

In some provincial towns where there is a back passage dividing the yards belonging to houses in separate streets, the covered ashpit of approved design is more convenient for the local authority to empty, and for some reasons more sanitary even than the bin, for the reason that it is generally situated at the furthest distance from the house, is invariably covered, and if of the proper capacity does not overflow on to the yard when a little extra garbage is produced. Such an ashpit is, of course, impossible in London, where there are no back passages, and where in the smaller property the houses are all attached in rows. Here the refuse would, of course, have to be emptied from the ashpit and carried by the local authority through the house. In such a case the only practical method of storing the refuse is in a bin. Especially in the poorer houses the bin is often kept under the scullery sink, or just outside the door, where it gives off putrifying odours. This is to some extent minimised by having a fitted cover to the bin, the use of which, of course, ceases when the bin is full, this being caused either by the overmuch garbage produced, or more often by the smallness of the bin supplied by the landlord. Too frequently, however, the bin gives place to a various assortment of boxes, old foot baths, &c., and it is here that the last stage of dirtiness appears to have been reached, and is surely a matter in which the sanitary inspector should deal severely.

The Public Health Act, 1875, section 42, gives power to the local authority to make by-laws regulating the collection of the refuse, and the Public Health (London) Act, 1891, infers that the periods of collection shall not be less than once in seven days.

The London County Council has made a by-law under section 16 (2) of the Public Health (London) Act, 1891, making it compulsory for a collection of at least once a week, and has required that the occupier shall place his bin either "on the kerbstone or on the outer edge of the footpath . . . or in a conveniently accessible position on the premises." From the occupier's point of view the latter might be at the back of the premises, and so to induce him to deposit it at the front, and also to save the great labour and danger of carrying a large and heavy bin through the premises, some local authorities supply free of charge a number (regulated according to requirements) of pails with handles over same. There can be no doubt that these are very insanitary indeed in a house, and their decoration of a street-front is by no means a thing of beauty at collection time.

Much of the insanitary condition of things could be avoided by a more frequent collection on the part of the local authority. In some districts even a daily collection might be necessary, while in most places from a sanitary point of view three times a week are needful, but it is somewhat surprising that even in London there are boroughs which collect once only in seven days.

One might at this point give way to the form of question put by "Cleanliness" as to the best "system of removal" and refer to that abomination the "dust van"—that cartload of filth, teeming with microbes—often uncovered, and awaiting the four winds of heaven to blow its pestilence down peoples' throats, and in at their windows. They do this better on some parts of the Continent. The householder is provided with a tall narrow circular bin, with a lid on it which he must keep on. A trolley comes along formed with a number of shelves on which are packed a quantity of clean empty bins, which the carman exchanges for a full one until the loaded trolley carries the full ones away for disposal with the garbage unseen and inodorous. The question is asked, what constitutes house refuse? The Public Health (London) Act, 1891, section 141, defines it thus:—". . . ashes, cinders, breeze, rubbish, nightsoil, and filth," but does not include trade refuse, and in the case of Mayor, &c., of Westminster *v.* Gordon Hotels, Ltd. (Divisional Court), the following were held to be house refuse:—Ashes from the grates, sawdust strewn on kitchen floors, empty sauce bottles and pressed meat tins, straw packing-cases for bottles, tea-leaves, waste-paper, egg-shells, lemon-peel, and the general dust from the rooms and staircases, and small quantities of broken crockery-ware and glass, inasmuch as they were the produce of persons living on the premises; and in reply to "Cleanliness" I do not think lawn-mown grass comes under that heading, neither the rubbish after spring cleaning if it consists of that left by the paperhanger, plasterer, &c., as these are clearly building materials and the refuse of his trade. The Corporation are bound by Act of Parliament to remove domestic refuse free of cost under penalties, and if they are requested by the occupier to remove trade refuse they shall do that also, but are entitled to make a charge for same.

The question of compulsion on the local authority to remove refuse turns not on the question of whether it is trade refuse or not, but the point is whether it is house refuse. If the question be answered in the affirmative the local authority are bound to remove same without making a charge.—Yours, &c.,

A BOROUGH ENGINEER.

SIR,—I expect that "Cleanliness" is smarting under a similar experience to one which happened to me some two or three years back. I had, as is not unusual in the summer months, the decorators at work and two or three rooms had been repapered. The builder left all his rubbish in my stable yard. I sent to him to remove it, but he *forgot* to do so, whereupon I got the town authority to have it carted away at my own expense as his trade refuse and deducted the small amount from his account, to which no objection was raised. Garden refuse could not be called by any stretch of imagination domestic refuse. Grass, for instance, put in a pit at the end of the garden to rot, makes an excellent manure. Last week "E. S." suggested another ashbin; he is quite right. Many houses are supplied with only a small one, with the result that it ought to be cleared two or three times per week.—Yours faithfully,

A CLERGYMAN.

London, S.W.: June 28, 1910.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, July 9.

Architectural Association : Athletic Sports at the Norwood Hockey Club Ground, Bickley.

Guild of Architects' Assistants : Visit to Wesleyan Methodist Hall, Westminster, S.W.

Tuesday, July 12.

British School at Rome : Lecture on "Statues recently Discovered in Rome," by Mrs. S. Arthur Strong, assistant director, at the rooms of the Royal Asiatic Society.

Thursday, July 14.

Northern Architectural Association : Annual Excursion to Byland and Rievaulx Abbeys.

Saturday, July 16.

Architectural Association, Camera Sketch and Debates Club : Excursion to Dieppe, Beauvais, Amiens, &c. Closes July 31.

Royal Sanitary Institute : Provincial Sessional Meeting in Cambridge.

Monday, July 18.

Royal Institute of Public Health : Congress opens at Birkenhead.

Tuesday, July 19.

Royal Archæological Institute : Annual Meeting at Oxford. Closes July 28.

ARCHITECTURE AT THE ROYAL ACADEMY.

WHEN one has examined the specimens of domestic and ecclesiastical architecture in the present exhibition of the Royal Academy there remains very little else, the number of public or semi-public buildings being decidedly below the average.

Mr. J. ERNEST FRANCK'S "Proposed Hospital for Hounslow" is a simple design, as befits the purpose, in brick, with a small quantity of stone for relief. The "Main Entrance, Textile School, Bradford," by Mr. REGINALD G. KIRKBY, is a nice piece of detail. Mr. PAUL WATERHOUSE'S "Refuge Assurance Co., Manchester; the Courtyard," is a charming piece of vista design with refined detail, and has been illustrated in *The Architect*.

The "New Crosby Hall, Chelsea," by Messrs. WRATTEN and GODFREY, shows how the hall of the old civic mansion is to form part of a group of educational buildings, which as yet have not reached the bricks and mortar stage. Messrs. J. and J. SWARBRICK'S "Elementary School, Didsbury: New Department for Girls," is a very good design, though without extravagance, and shown in a decent pen and ink perspective.

"The Radium Institute, Riding House Street, Portland Place," by Mr. T. P. FIGGIS, has a cleverly designed front, of modern type. Mr. H. P. BURKE DOWNING'S "Pelham School, Wimbledon," is a nice drawing of one of the best modern elementary schools in London, full of good artistic feeling in design. Mr. HENRY BECK'S "Police Courts, Burton-on-Trent," is one of the few examples of municipal architecture to be seen. The chief feature is a central dome, which does not compose happily with the flanking wings at a lower level, from which it appears too much disconnected. Mr. H. P. BURKE DOWNING'S "Public Hall, Llanelly," has been illustrated in *The Architect*, and is a quite praiseworthy solution of the problem of combining a place of entertainment with shop premises that, like the Irishman's pig, "pay the rint."

"The Mitchell Library, Glasgow," by Mr. WILLIAM B. WHITIE, is a good piece of detail shown in an excellent drawing in the French manner. Messrs. HALL & DODS, in their "Insurance Offices, Brisbane," show how excellently English architecture is being exemplified in the Dominions beyond the Seas. A tall up-standing building, with high roof, itself impressive in size and proportion, is besides a specimen of good design throughout.

The "Home for Crippled Children, Pyrford, near Woking, for the Church of England Waifs and Strays Society," by Mr. EDWARD J. MAY, is a charming instance of picturesque simplicity, and a clever dodge is introduced into the chapel by thickening out the wall where traceried windows occur, thus obtaining depth of reveal without extravagance. The whole design bears the impress of artistic effect gained by the expenditure of brain rather than money.

Mr. JOHN MURRAY'S "New Office of H.M. Woods, Forests and Land Revenues, Whitehall," occupies a place of honour, worthily accorded to a fine design capitally drawn. As an example of garden architecture, Mr. THOMAS H. MAWSON'S "Pond Garden, Pittencrieff House, Dunfermline," is a good piece of scenic composition, with a circular pond in the foreground and a topiary yew avenue leading up to the house.

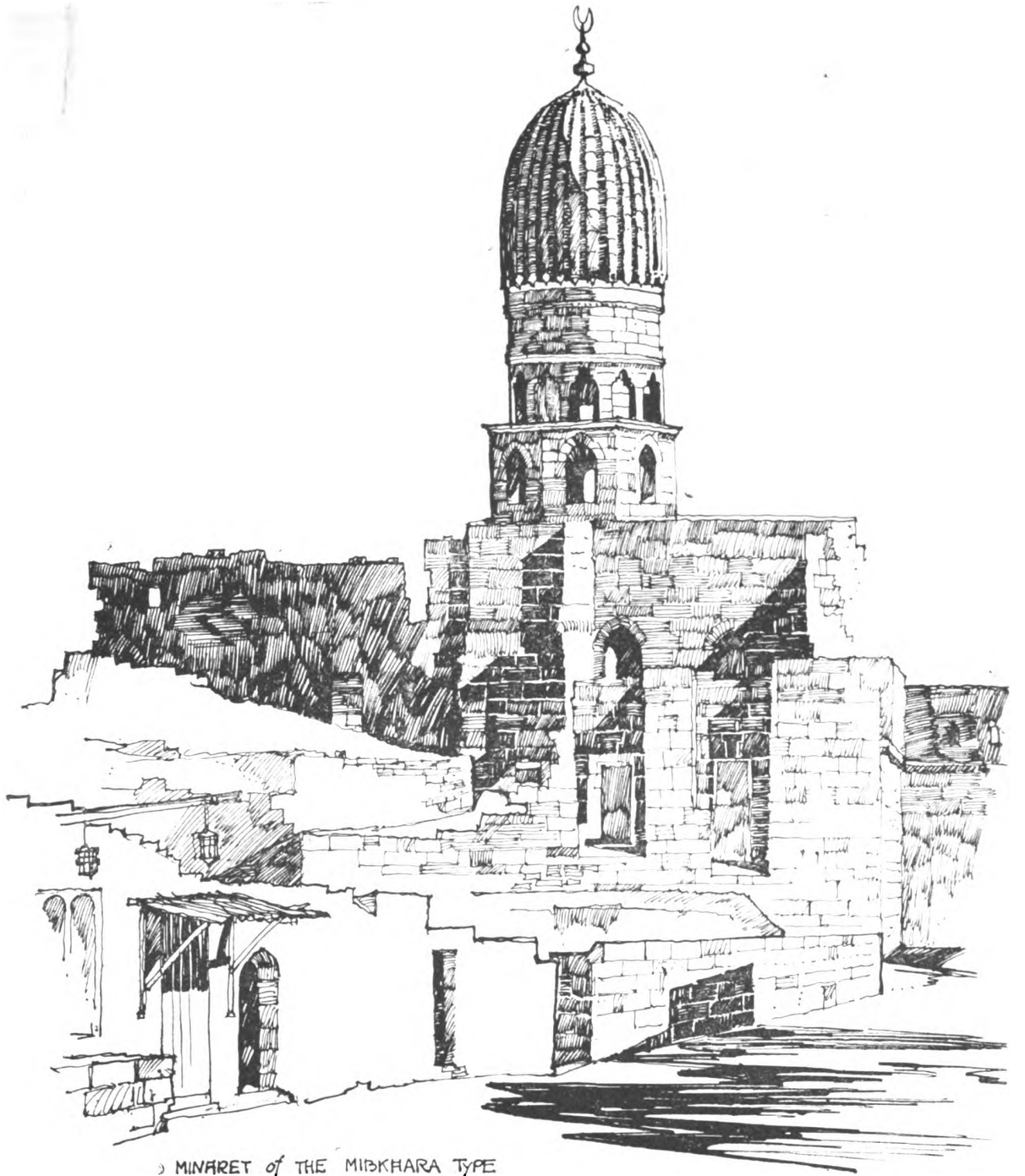
Mr. EDWARD WARREN'S "Dining Hall, Caius College, Cambridge," shows a pleasant interior with Jacobean screen and hammer-beam roof, with walls panelled to the sill level of windows high up. The "Mantel, Entrance Hall of an Insurance Office, Euston Square," by Professor BERESFORD PITE, calls for attention by its curious medley and large and small parts in the detail, which has a bizarre effect that, if striking, is decidedly unpleasant.

Mr. W. D. CAROE has wisely, in his "University of South Wales and Monmouthshire: Memorial Research Laboratory," shown only one corner of the group of university buildings, the most salient characteristic of which is the incongruity in design of its several parts, destroying all effect of unity, and suggesting that the author has designed the buildings in sections to half-inch scale, and so could not get enough on one sheet of paper to be able to realise their effect in the necessary contiguity that is forced upon them in execution. Mr. HORACE F. CASTLE'S "Scheme for the Colour Decoration of a Council Chamber" is a fine piece of colour decoration, the effect of which in realisation would be more satisfactory in a room with subdued, rather than brilliant, lighting.

Amongst the oil paintings are some that are notable pieces of architectural design, absolutely unfettered by considerations of cost or probability. Thus in Mr. GEORGE C. HAITE'S "In Tempe: or, the Dales of Arcady," we have a design for a water garden, with an octastyle Doric temple at one end, mountains in the background, and in the foreground a lily pond with reflections, quite Arcadian. "The Roeder Bogen, Rothenburg o' Tauber, Bavaria," by Mr. ELIAS BANCROFT, is not a photograph nor a portrait, but a quite imaginary scheme of sunlight and colour, devoid of rest, which to our mind is the predominant atmosphere of this charming old walled town, which seems to have quietly slept since the Thirty Years' War. Mr. E. WAKE COOK'S "Dreamland Pageantry" is an architectural phantasy of domes, bridges, garden temples, steps and terraces that may give impulse in imagination to architects seeking for inspiration when jaded by party walls and ancient lights.

In the Black and White Room are some works that are worthy of notice as lessons in the presentment of architecture, amongst which we may particularly notice Mr. DOUGLAS J. SMART'S "Tour de l'Eglise St. Jacques, Anvers"; the "Cloisters of St. Trophime, Arles," by Mr. CHARLES O. MURRAY; "St. George's Church, Hanover

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Square," by Mr. NATHANIEL SPARKS; Mr. STANLEY ANDERSON'S "Doorway of St. Mary-le-Bow Church, Cheapside"; "Madison Garden, New York," by Miss ANNIE WILLIAMS; "Notre Dame, St. Lo," by Mr. CHARLES J. WATSON; Mr. WILLIAM WALCOT'S "St. Paul's"; "Rothenburg o' Tauber," by Miss ADELINE S. ILLINGWORTH; Mr. H. A. WEBSTER'S "Ancienne Faculté de Médecine, Paris"; and Miss MARGARET SISSONS'S "Market Place, Thun."

NOTES AND COMMENTS.

THE consecration of the Lady Chapel of Liverpool Cathedral marks the first stage in the realisation of the design of Mr. G. GILBERT SCOTT, and gives earnest of a worthy monument of English ecclesiastical architecture in the twentieth century. We are interested to learn from the *Liverpool Courier* that, in dealing with the sculpture and carving, Mr. SCOTT has followed on mediæval lines and allowed his carvers a fairly free hand in their work. Given craftsmen of sufficient sympathy and ability, this is certainly the preferable method, rather than that of turning the workman into a mere machine to translate into stone or wood a carefully prepared plaster model.

WE have taken an opportunity of examining for ourselves the wrought-iron screenwork and gates at Hampton Court, as to which a cross-fire of assertion and contradiction took place a short time since, as we noted in these columns. It is true that TIJOU'S work in the delicately detailed screens at the river end of the Privy Garden have suffered in some degree from decay, and possibly wilful damage, but the whole extent of this is so small that it needs quite careful inspection to recognise, whilst the general design is in no way depreciated, and the most characteristic and charming parts of the detail, delicately wrought as they are, have not suffered to any appreciable extent. We see no reason to fear that the restoration of

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these screens to their rightful position is at all likely to result in further injury, provided they are kept carefully protected by good paint. As for the gates to the Home Park, these are to all intents and purposes as good as when they were first erected.

THE *Observer* has drawn an expression of opinion as to the desirability of rebuilding Buckingham Palace from Mr. REGINALD BLOMFIELD, Mr. BERESFORD PITE, Mr. T. E. COLLCUTT, Mr. GUY DAWBER, Mr. LEONARD STOKES, Mr. J. S. GIBSON, and Mr. H. T. HARE, all of whom concur, as indeed everyone must who has any appreciation for architecture, in the opinion, strongly expressed, that Buckingham Palace is unworthy to be a residence of the KING OF ENGLAND, and a banal inconclusion to the scheme that has been adopted for the Mall and the Victoria Memorial. The general feeling seems to be that, as no British architect of established position has, for lack of opportunity, shown his ability to design a Royal Palace, it would be desirable that there should be, in the words of Mr. GUY DAWBER, "a competition open to British architects, both at home and in the over-seas dominions." With this we agree. It is quite as likely that a grand conception would be evolved by a young and unknown genius as by any of the present heads of the profession.

THE Architectural Association Camera, Sketch, and Debates Club, the latest and somewhat incongruous fusion in the A.A., has arranged a charming excursion to France from July 16 to July 31, during which time tours will be made around Dieppe, Beauvais, Amiens, and Abbeville. These Continental excursions of the former Camera and Sketching Club take advantage of the opportunity of cheap travelling and hotels to be found in France, and so enable the participants to study architecture and enjoy a pleasant holiday at much less cost than is experienced in the older official excursion of the Architectural Association.

THE athletic members of the Architectural Association hold their annual sports to-morrow on the ground of the Norwood Hockey Club at Bickley, and we hope they will have finer weather than would have been their lot last Saturday.

A LIGHT is thrown on the way in which architectural work is sometimes done by the case of Mr. F. W. ACKLAND HODGE against the Matlock Urban District Council. The plaintiff was at one time employed by Messrs. WARING & GILLOWS, and had the supervision of architectural work for them to the extent of 180,000*l.*, including the reconstruction of the Royal Hotel, Matlock Bath. He had also supervised alterations to King's Cross Station and the rebuilding of the Great Northern Railway Company's hotel at Leeds whilst in the employ of Messrs. WARING & GILLOWS. The plaintiff was appointed joint architect with Mr. NUTTALL, the Council's architect, for a new kursaal at Matlock, but was dismissed after the end of nine months, and brought an action against the defendants for breach of contract. Counsel for the defence said the defendants refused to allow the plaintiff to proceed because they found out he was not what he represented himself to be. They contended that he was not an architect, that he had acted dishonourably towards WARING & GILLOWS, and that his plans were grossly in excess of what the defendants were able to spend. As they had been deceived they considered they were entitled to cancel the appointment. The chief ground, apparently, for the defence that plaintiff was not an architect was that, as admitted in cross-examination, he did not make the drawings himself, but sketched them roughly and employed a draughtsman to draw them properly; but the judge, Mr. JUSTICE LAWRENCE, put the point to the plaintiff that it is a custom of the profession for architects to make a rough sketch and submit it to draughtsmen to draw properly. The jury found a verdict for the plaintiff for 280*l.* In his evidence in chief the plaintiff explained that in 1908 he had had some litigation with WARING & GILLOWS with respect to the plans for the extension of the Royal Hotel, Matlock Bath. He agreed to do that work on his own account, and sent in his resignation to WARING & GILLOWS, but because he had not actually left their service when the agreement with the hotel proprietors was signed WARING & GILLOWS contended that he was their agent, and that they were entitled to his commission. By counsel's advice he consented to judgment for WARING & GILLOWS for 980*l.*

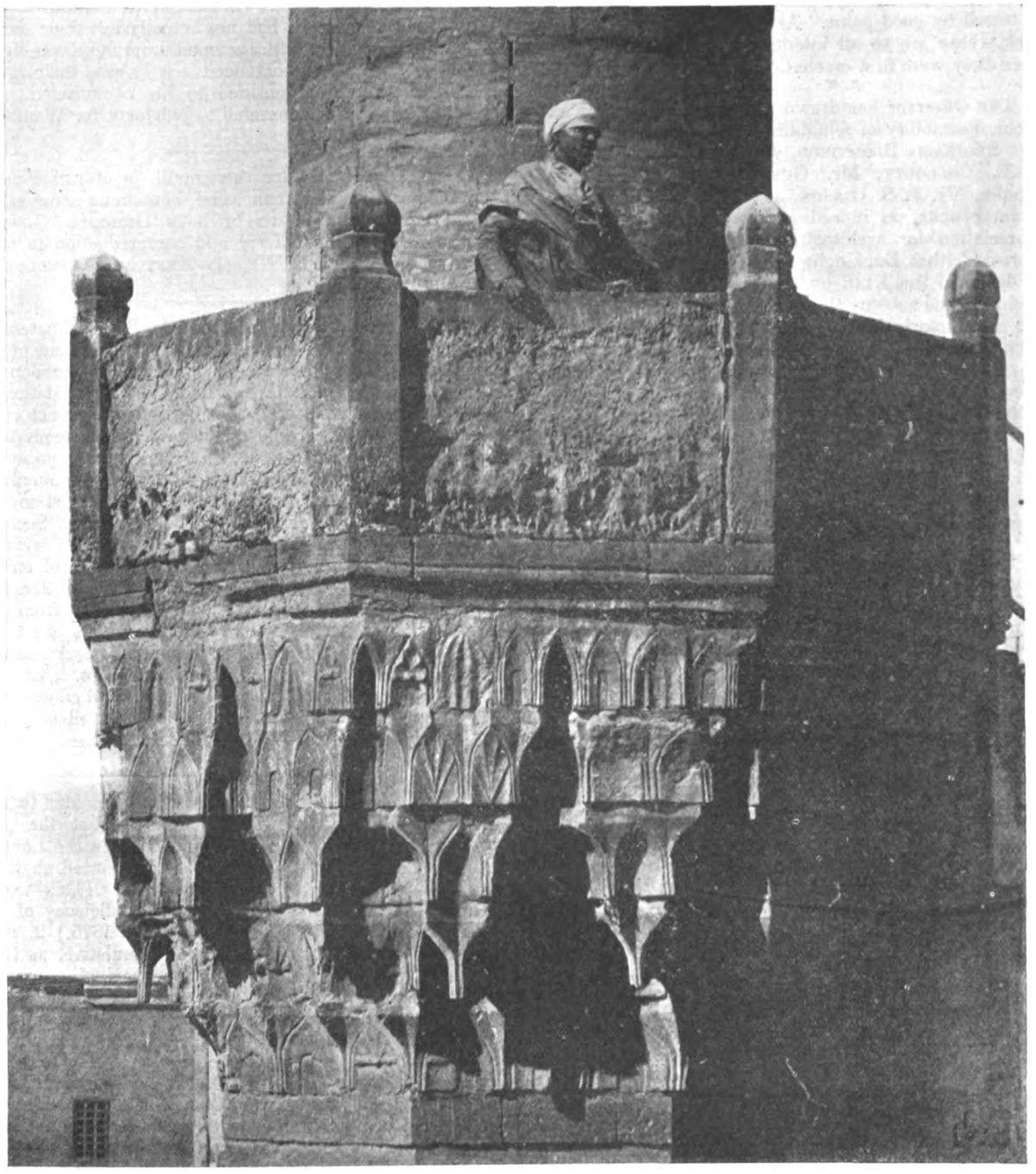
THE *Connoisseur* for this month is of rather more architectural interest than usual, containing some excellent photographs of the famous GRINLING GIBBONS carvings from Holme Lacy and a reproduction in half-tone of the portrait of WILLIAM KENT by BARTHOLOMEW DANDRIDGE.

AN influential deputation from the Smoke Abatement League waited privately on Mr. BURNS, President of the Local Government Board, at his office in London on June 29, to urge the necessity for further legislation to deal more effectively with the "extensive and notorious public evil" of the smoke nuisance. The deputation, introduced by Mr. HARVEY, M.P., included representatives from Glasgow, Manchester, Liverpool, Birmingham, Bradford, Halifax, and other English provincial towns, and from the London Coal Smoke Abatement Society. Although Mr. BURNS received the deputation sympathetically, it is unfortunate for the advocates of smoke abatement that a House of Commons Committee has decided not to eliminate the word "black" from the statute description of "black smoke." This is an important point, as the difficulty of proving blackness has much hampered legal action against offenders. The only thing to be done is to keep pegging away and educate the legislature to the point of recognition that all smoke is needless waste of fuel and detrimental to the health of the community.

THE memorial which the deputation presented to Mr. BURNS made the following requests:—That the provisions for the control of smoke embodied in the London County Council's Bill shortly to be introduced shall be made applicable to the whole country. (This would remove the limitations which spoil the efficiency of the smoke clauses of the Public Health Act of 1875.) 2. That the fines should be made high and cumulative, as they now are in Leeds and in London, beginning with a minimum of 5*l.*, and double with each subsequent offence within a period of three years till they reach a maximum of not less than 40*l.* "Certain manufacturers will not reform till it is made more obviously costly to make smoke than not to make it." 3. The creation of a Smoke Department of the Local Government Board, with inspectors, competent men with scientific training, who should supervise and report upon the success of the local authorities in keeping down smoke, and give them advice and assistance. If, in the opinion of the Board, these authorities prove ineffective, the Board should itself undertake the control of smoke. 4. In order to remove the domestic smoke nuisance also, that, after a reasonable delay, all new fireplaces should be inspected and passed as drains and plans are. 5. "Believing that cheap gas will be a large factor in the ultimate solution of the smoke question, we trust that the Board, in dealing with the borrowing powers asked for by gas undertakings, will absolutely prohibit the pernicious practice of selling gas dear to relieve the rates. This leads to wasteful expenditure, is unfair to large users of gas, and prevents the development of this clean and civilised way of obtaining heat and power."

A LETTER from the Bishop of SOUTHWARK to the *Times* makes appeal for a sum of 7,000*l.* for repairing parts of the building which at the restoration were not overhauled, being then intact, but now "seriously and even dangerously out of repair." It is the same old story—ecclesiastical buildings are left unrepaired till they are dangerous, then comes a frantic appeal for funds. In the case of Southwark there is, perhaps, some better excuse than

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DETAIL OF A GALLERY ON A MINARET, CAIRO.

usual, as the church seems to have been elevated to the dignity of a cathedral without proper provision being made for maintenance. It is true the Bishop now appeals for a maintenance fund of 30,000*l*., but from his letter we gather that this means the maintenance of a clerical staff, and not of the fabric.

WHAT is said to be the first Roman antiquity found in the city of Nottingham has been discovered in the shape of an earthenware pot containing some sixty coins of silver and copper, which, on the authority of Professor GRANGER, D.Litt.Lond., formerly A.R.I.B.A., range between the dates of VESPASIAN (A.D. 69-79) and MARCUS AURELIUS, who died A.D. 180, and therefore are scarcely likely to be the hidden treasure of a collector, but evidence of the presence of an inhabitant of Roman times, although up to the present the nearest Roman colonies to Nottingham are supposed to have been at Hucknall, Barton, and East Bridgford.

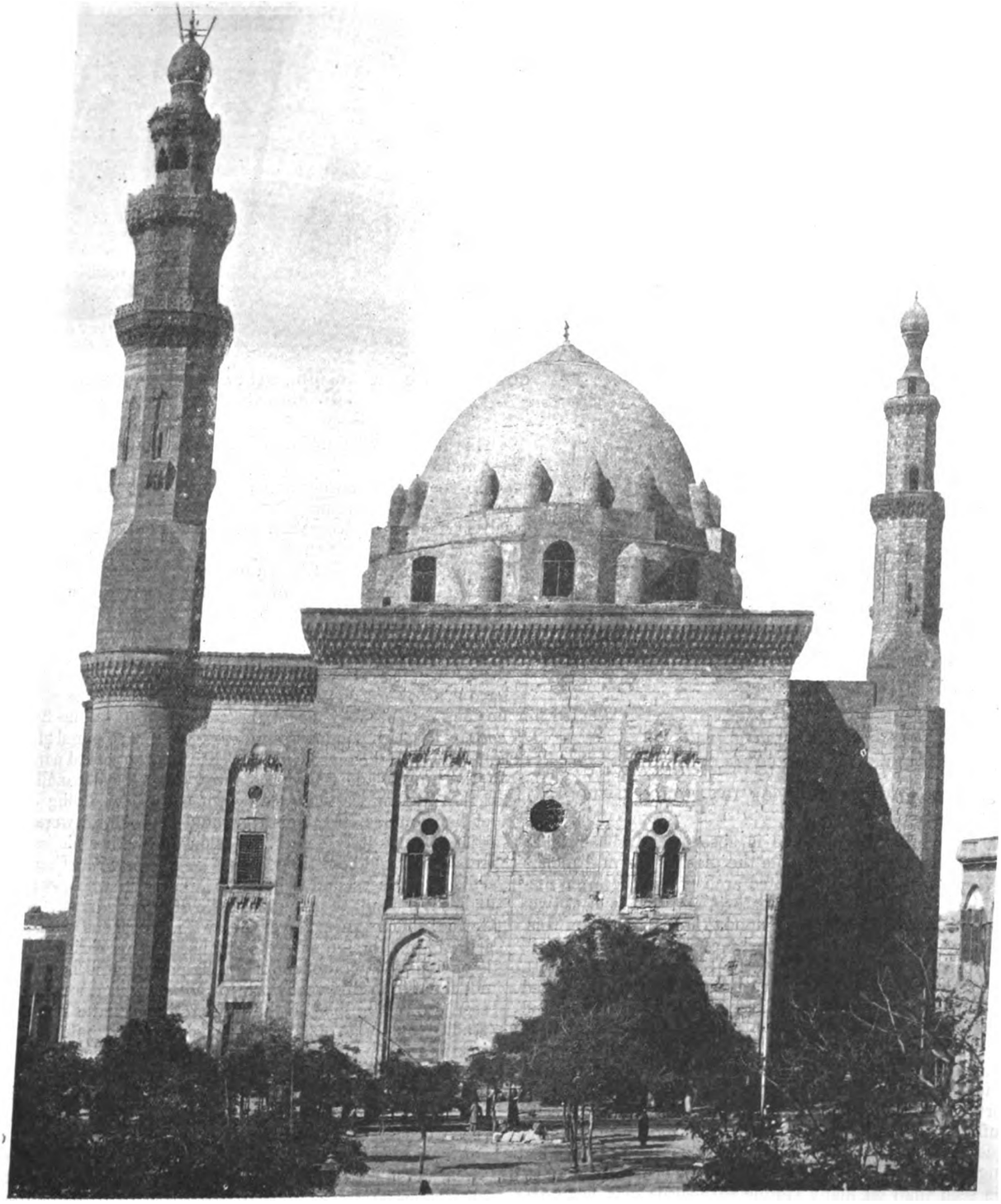
POSSIBLY some of our readers may be able to respond to the request for information that the Rev. J. GARFORTH, rector of Spexhall-cum-Wissett, Halesworth, makes in the *Guardian*, to which he writes:—"Our round tower of Spexhall fell in 1720, and our kind squire has taken the initiative in seeking to raise it. But he and his architect, Mr. SAREL, are very desirous to ascertain whether or no there may be a sketch of the church and tower, before it fell, among a collection of drawings of Suffolk churches. I know of Mr. DAVY'S collection and of others in the Ipswich Museum and at Bury St. Edmunds, but I much fear they do not contain a sketch previous to 1720. In taking the initiative and promising his usual kind support, our squire, Mr. CALVERT, would earnestly look for assistance from lovers of towers and bells. The leading antiquary, Dr. J. CHARLES COX, pronounces the ruins of Spexhall Tower to be Saxon with Norman and Early English additions."

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SOME BRIEF NOTES ON THE MOSQUES OF CAIRO.

By GORDON SANDERSON.

THERE are some who assert that Saracenic architecture is not so dignified in its expression as the Gothic of the West. It is very difficult to state whether this is true or not. The impressiveness of a mosque like that of Sultan Hasan or Ibn-Tulun (v. illustrations) is a close rival to the vaulted and cloistered dignity of the finest Gothic examples. Still, there always seems to be a sense of unpermanence about Arab decoration which offends many who have been accustomed to the more lasting examples of Europe. It must be remembered that this form of architecture is one which is especially well adapted to its surroundings, and suited to the ritual of the Moham-

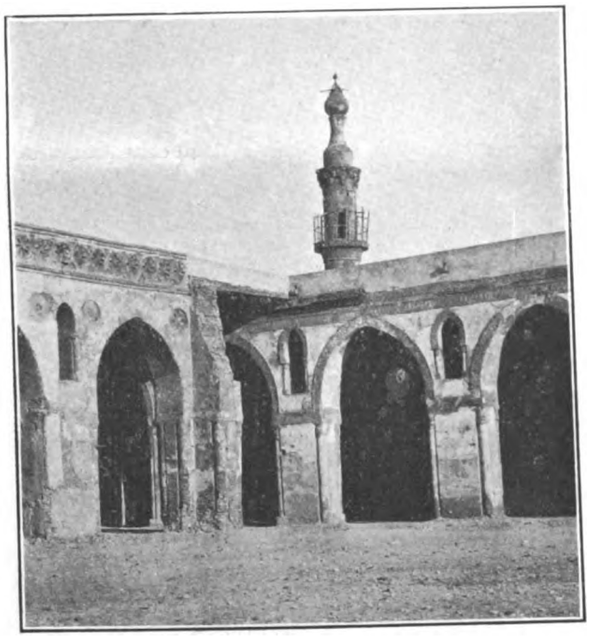


FACADE OF MOSQUE OF SULTAN HASAN, CAIRO.

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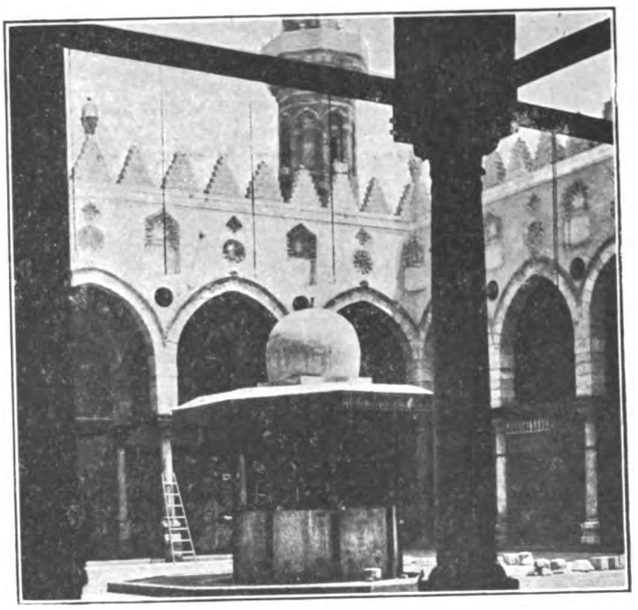
medan religion. It is also a good expression of the mind of the craftsman who executed its details, being intricate and painstaking almost to an unnecessary degree, and these curious qualities of the Arab mind are nowhere so clearly expressed as in their buildings. The roundabout patterns, geometrical or otherwise, are as obviously the children of the oriental mind, accustomed for long centuries to intrigue, as are the vaulted naves and crocketted spires of the English mediæval craftsman. In this they show the same feeling—namely, the same striving after an unseen Being—and this is to be seen in the minarets and the spires; the endeavour to get nearer to ALLAH in the one case and GOD in the other, and there is little doubt that Mohammedan architecture is only second to the Christian of the same date, which is by the majority acknowledged as the most perfected of the styles. Mosque building in Cairo did not extend over a great number of years, but during the building period enough mosques were built to last for some time. Repairs are, of course, necessary, and these are being done by a very capable architect as far as funds will allow. Mosques may be roughly divided into two types—the colonnaded and the cruciform type.

The early colonnaded mosques, of which Ibn-Tulun (v. illustration) is an example, are generally spacious colonnaded courts built in the once open suburbs of the city, where an ample site was available. In this mosque the rows of arches running parallel to the sides of the square court are in brick, and have all been decorated with plaster ornamentation done by hand, and obviously by the hand of no mean craftsman. The mechanical effect of



COURTYARD OF MOSQUE OF IBN-TULUN, CAIRO.

work reproduced by a mould is absent, and the simple patterns worked by hand while the plaster was still moist are very beautiful. The pointed arch is seen here for the first time as a constructional feature, and this at least two centuries before its use in England. For this reason this building is one of the landmarks of architecture, but it is surprising how few know of it. It has no dome and its minaret, though a striking feature, can hardly be called one in the strict sense of the word. There is no tomb, and therefore no dome, as a dome is only found in a mosque in which there is a tomb or in which it was intended to place one. There is a frieze in wood running round the whole length of the inner arcade, but this is now unfortunately very much decayed. The plasterwork has also suffered at the hands of time. This mosque makes one question the assertion that Saracenic building is not lasting. Finished in 878 A.D., more of the ornament may still be seen than on many Gothic cathedrals of a later date. It must be borne in mind that the materials used are brick, plaster and wood, and it is a strong testimony to the excellence of the climate and the quality of the workmanship that it has lasted as long as it has. The permanence of Saracenic work compares very favourably, generally speaking, with that of its western contemporary, conditions balance equally; the Saracenic has on its side lightness of materials and excellence of climate against exactly the reverse conditions prevalent in Europe. This has, of course, exceptions; for instance, many mosques are in stone, but for decoration, plaster, wood and other delicate materials were freely used.

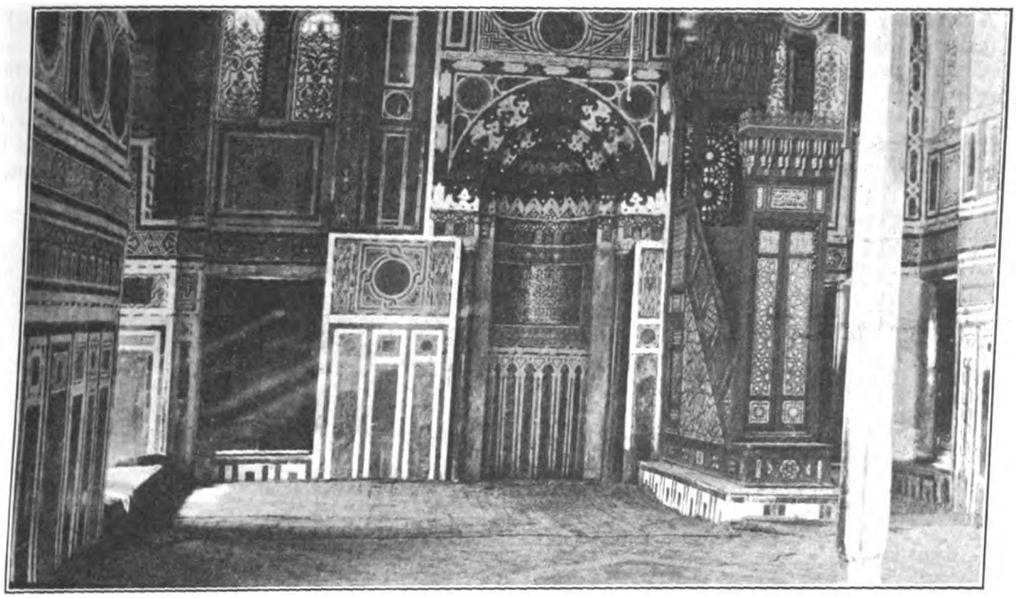


COURTYARD OF A MOSQUE, CAIRO, SHOWING FOUNTAIN FOR ABLUTIONS.

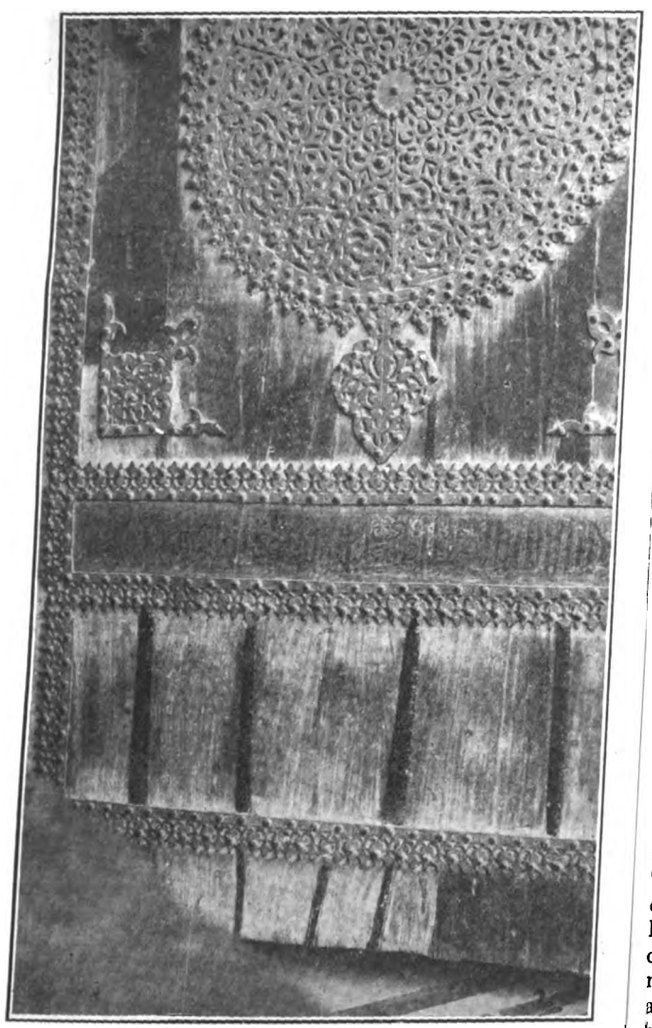
This mosque of Ibn-Tulun is in great contrast to the later and rather smaller mosques of cruciform plan built within the walls of Cairo. In these little jewels in the crown of architecture no pains were spared to cover all the wall surface with decoration (v. illustration). Christian churches and Egyptian temples were robbed of their marble columns, which, sawn in pieces, went to make up the rich interior panelling of which the illustration is only one example of many. The obligation of using round columns has, no doubt, evolved the curious circular patterns so frequently seen, and which, like so many of the Saracenic designs for the adornment of wall surfaces, have little or no constructional meaning. From the photo no idea can be obtained of the colour effect. The light coming through windows of most exquisitely coloured glass and falling on the mosaic of the "Kibla," the carved panels of the pulpit, and the varicoloured geometrical panelling of the interior wall-surface, produces a bewildering and yet harmonious effect, and it would be doubtful were an artist to accurately depict the colours, whether his interpretation would be believed by those who saw it. There is a distinctiveness and originality about the whole which makes it difficult to place this style of art side by side with Gothic. It is an art evolved by the Saracens from the arts of their foreign subjects and used with a daring which is obviously the outcome of a religion which is nothing if not fanatic. The woodwork, of which a good example is seen in the pulpit of the illustration, is the carefully studied outcome of climatic consideration. Subdivided into as small panels as was possible, the likelihood of warping or shrinking, owing to the great heat, was reduced to a minimum. It is doubtful whether the Western mind possesses the ingenuity and the patience which must have been necessary to execute even one of the panels of one of these pieces of furniture, in which ebony and ivory were freely used. It is probable that the wood carving, as other branches of Saracenic art, was the work of foreign subjects—in this instance of the Copts—as fine wood screens

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of this kind are found in Coptic churches of a much earlier date. The patterns are almost universally arabesque or scroll pattern, as the Koran forbids the reproduction of animal forms, although this law is not always rigorously observed.



INTERIOR OF A CRUCIFORM MOSQUE, CAIRO.



BRONZE DOOR FURNITURE.—MOSQUE OF KAIT BEY, CAIRO.

The dados are generally slabs of marble of different colours framed by narrow bands, the colours of the marble being red, yellow and black as a rule. Hieroglyphic inscriptions on stones, Roman or Egyptian capitals used as column bases are common, and the mosque of Sultan Hasan had as its quarry the pyramids of Giza, about ten miles away.

The "Kibla" or arched niche in the centre of the illustration is a necessary feature in all mosques, and corresponds to the altar of the Christian church. On it was richly lavished mosaic, mother of pearl, and the choicest marble, while in this instance above the capitals of the niched columns there is a band of small columns of imitation turquoise inset with Saracenic "opus Alexandrinum," which has a most striking effect. The pulpit or "mimbar," previously described, always stands on the left-hand side of the "Kibla."

The metal work is seen to advantage in the plaques, hinges, and doors themselves of the mosques (v. illustration), and the same lavish display of material and untiring ingenuity of design is to be remarked. Silver is freely used in conjunction with brass and bronze.

Of the later or cruciform type of mosque, Sultan Hasan 1356 A.D. (v. illustrations) is the best example. Those who have had the good fortune to pass up between it and the new mosque now building on the road to the citadel cannot fail to have been struck by the almost awe-inspiring effect this building, with its massive cornice and stalactite clustered porch, produces. The mighty arches of its court, built at a time when cement was unknown, are triumphs of engineering skill. They may be taken as being perhaps the largest arches of their kind in the world. Its minarets, the larger of which is the highest in Cairo, are, as is its dome, disappointing. The latter is squat and the former do not balance. On its north side is a perfect warren of apartments, which served as the schools attached to the mosques and as the houses of the "Faithful," whose duty lay in the mosque itself. The Sultan responsible for the mosque was so pleased with the design that he cut off the architect's right hand, so that he should not design a second one, a reward which if conferred in these days should be so conferred for failure rather than success. The detail in this mosque is not so good, and the excellent effect is produced by size. Its situation has led to its having suffered severely. It is under the citadel, and during the Mameluke period, when street fighting was the natural order of things, it was used as a matter of course as the point of vantage from which the citadel could be bombarded, or the road to the citadel held. Its original dome has fallen, and there were to have been four minarets, three of which were built. One of these fell into the school below, one became ruined and was rebuilt too short, and the tallest is at the moment being restored.

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The minarets of Cairo, viewed from the high ground of the citadel, produce an effect which it would be hard to parallel in Western countries. They and the domes are undoubtedly the most prominent features in Saracenic architecture. A necessity demanded by the ritual of the Mohammedan religion, these minarets have been made in the later mosques their most striking features (v. illustrations). The prototype of the minaret was a wooden stag-



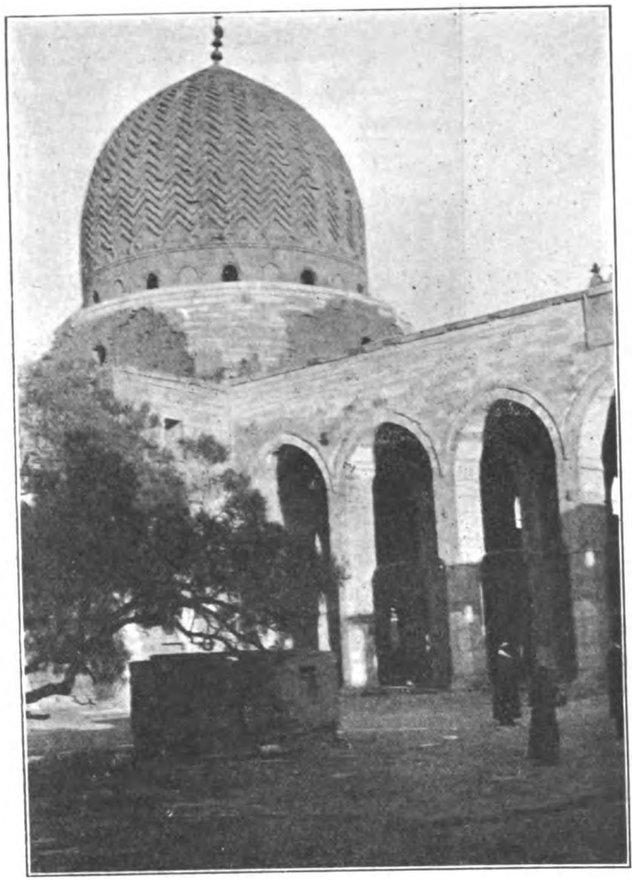
A MINARET, CAIRO.

ing erected at the corners of the mosque, from which the muezzin gave the call to prayer five times a day. The minaret, as may be seen from the illustrations, has generally several projecting galleries at various heights, these galleries being supported by stalactite vaulting (v. illustration). Minarets are of varied design, generally starting square and tapering upwards with a gradually diminishing series of octagons, each fresh series being marked by a gallery with a parapet. Sometimes, instead of a diminishing series of octagons, circles or squares are similarly used. The minarets of El-Hakim (v. illustration) are some of the earliest and most interesting examples. This peculiar fluted type is known as the "Mibkhara" (*i.e.* censer).

Domes are of two kinds—brick and stone. The stone ones are generally ornamented, while the brick ones are left plain, their outsides being merely plastered (v. illustrations). The ornamentation consists in the most elaborate chevrons, arabesques, and geometrical patterns. Domes are, as most Saracenic designs, geometrical in their proportions. The period for building domes was between 1320 and 1360, at which time there was much architectural and artistic enthusiasm.

At the springing level of the dome a wood cill is generally used, so as to distribute the weight of the dome equally over the drum (v. illustration of Sultan Hasan). The art of dome building is thoroughly understood in all its branches by native builders at this time.

In these brief notes it has not been possible to do more than merely touch on this most interesting style of architecture. A building tradition long dormant in Egypt was awakened by an infusion of Tartar energy and spirit. The first Saracenic mosque in Cairo of importance—that of Ibn-Tulun—was the building of a Tartar sultan, and it was the Mamelukes, originally Turkish and Circassian slaves, and therefore of Tartar blood, who have been rightly called the "dome-builders par excellence," * who



A STONE DOME, CAIRO.

gave to Saracenic art that stimulus which brought it to its zenith. The dominant notes in the tone of design are daring, coupled with untiring ingenuity and patience, the former quality the attribute of the Tartar and the latter two those of the Egyptian. The sultans, coarse voluptuaries as they might seem to us, had nevertheless many redeeming features; fine soldiers and sportsmen as they were, they had a vivid enthusiasm for the arts which have made Cairo the place to which all those interested in Saracenic art will eagerly turn.

ILLUSTRATIONS.

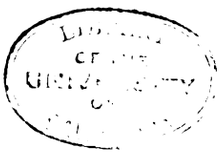
THE CASINO, CLONTARF, CO. DUBLIN.

THIS building was erected by the Earl of CHARLEMONT, who was Commander-in-Chief of the Irish Volunteers. It stands in the grounds of Marino, Clontarf, now the property of the Christian Brothers. There is some danger of its having to be demolished some time in the near future, as the lease of the ground on which it stands, and which is the property of the Corporation of Dublin, will soon expire, and when that happens the site will, in all likelihood, be used for building purposes by the city authorities (the owners).

The architect was Sir WILLIAM CHAMBERS, and the drawings we reproduce, which were submitted by Mr. CYRIL KEEFE, "Dubline," were awarded the prize for April in *The Architect* Students' Sketching and Measuring Club.

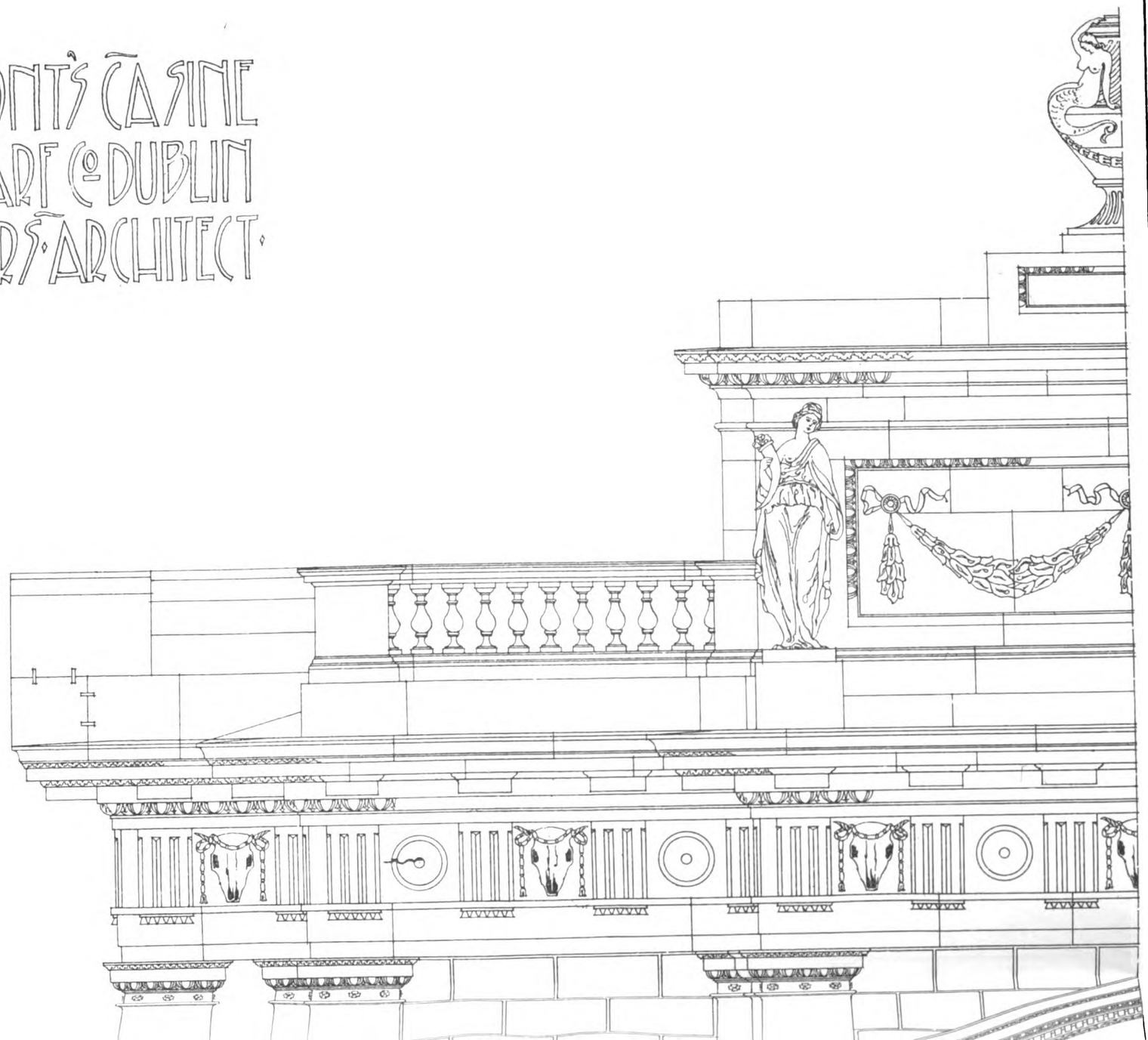
* S. L. Poole, *Mediæval Towns: Cairo.*

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LORD CHARLEMONT'S CASINE MARINO CLONTARF Co DUBLIN SIR Wm CHAMBERS ARCHITECT.



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HALF EAST ELEVATION



PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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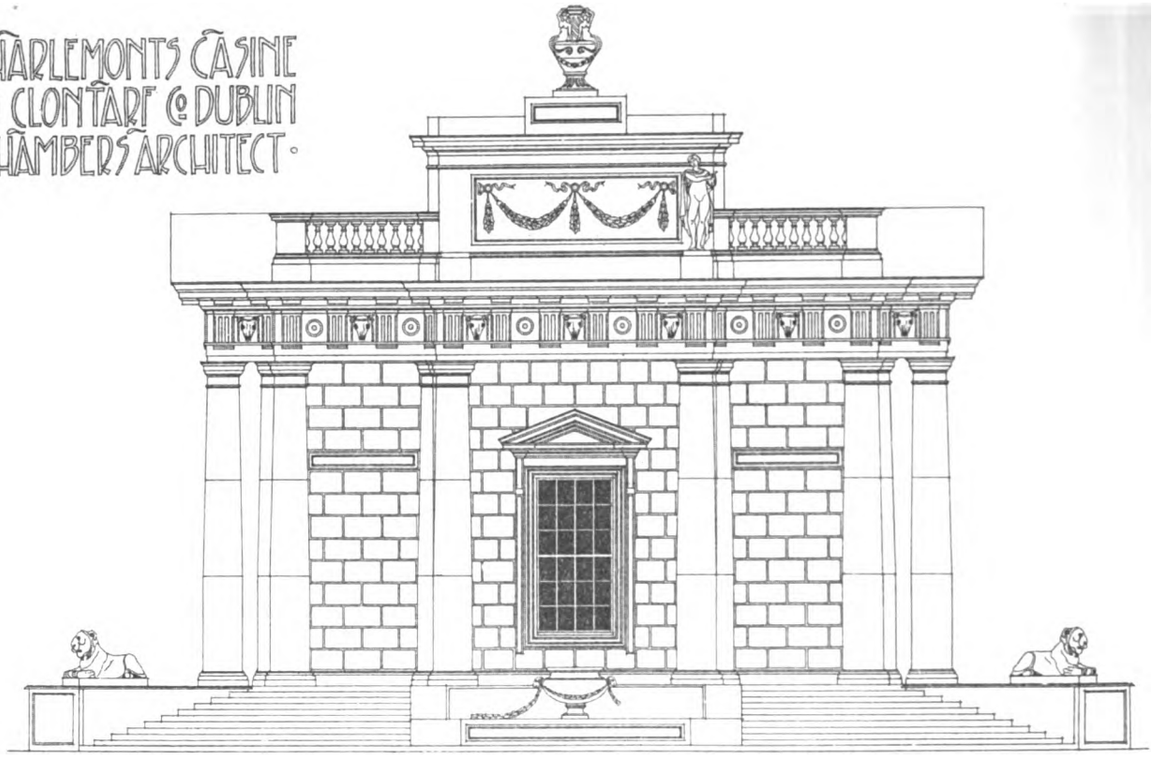


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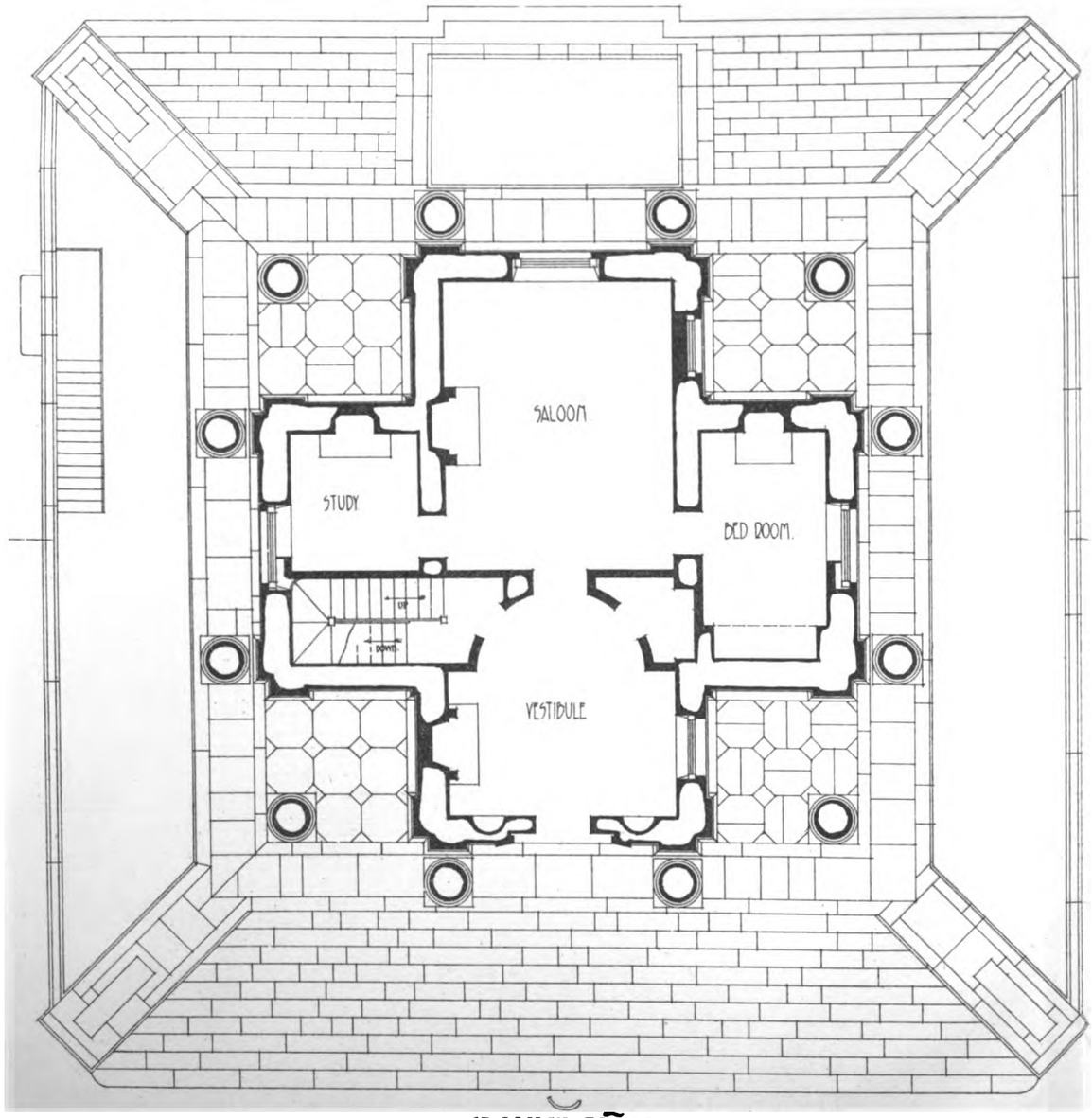
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LORD CHARLEMONTS CASINE
MARINO CLONTARF @ DUBLIN
SIR Wm CHAMBERS ARCHITECT.



WEST ELEVATION.

A



B

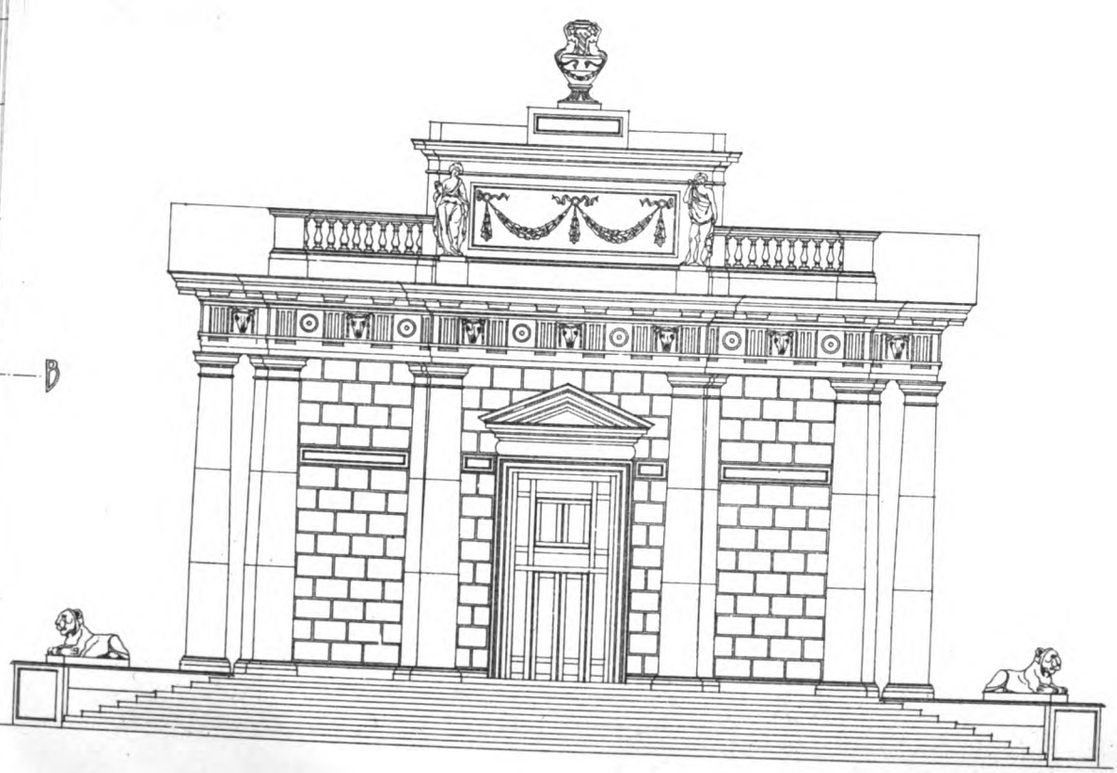
GROUND PLAN

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SOUTH ELEVATION SHEWING HALF ELEVATION BASEMENT.

B



EAST ELEVATION.

SCALE

3 4 5 2 1 0 5 10 15 20 25 30 FEET.

MEASURED AND DRAWN 1906 : 1909. CYRIL KEEPE.

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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LORD CHARLEMONT'S CASTLE MARINO CLONTARF Co DUBLIN DETAILS.

ARCHITRAVE TO ENTRANCE DOOR

ARCHITRAVE TO WINDOWS.

MOULD AT FRIZE PANEL

PEDIMENT TO WINDOWS.

LOWER PORTION OF MAIN CORNICE

DETAIL OF PRINCIPAL CORNICE

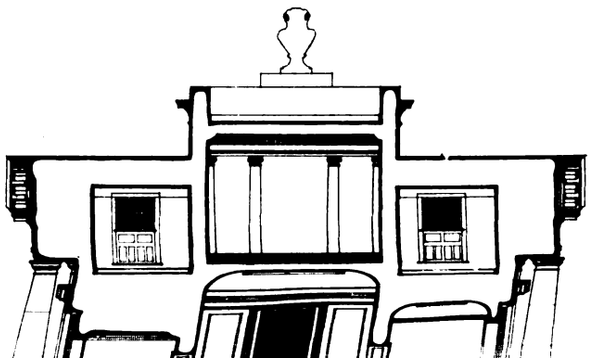
CAP AND BASE TO COLUMNS

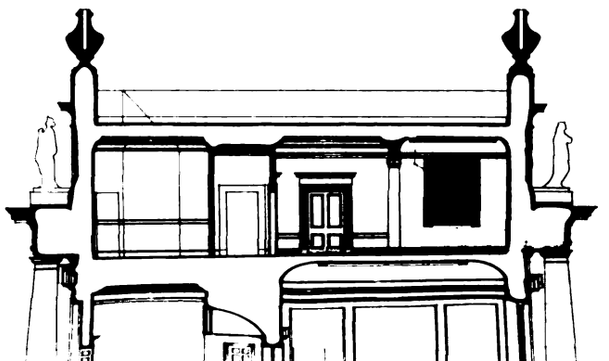
CORNICE AT ATTIC

MOULD AT LOGGIA

0 1 2 3 4 5 6 7 8 9 10

SCALE OF INCHES.





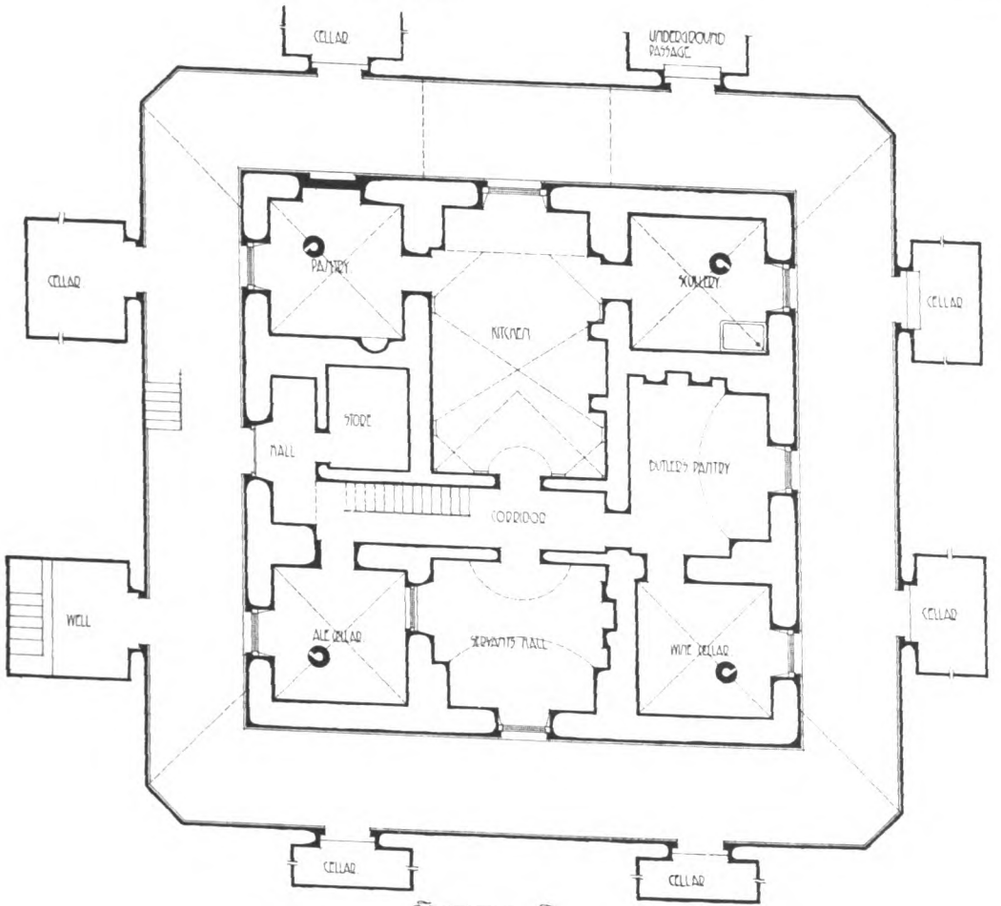
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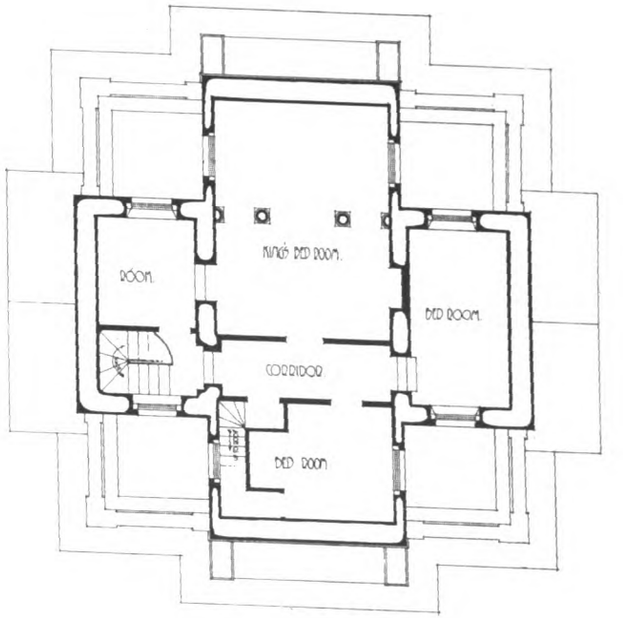
SECTION A-B



SECTION C-D



BASEMENT PLAN



FIRST FLOOR PLAN

SCALE



MEASURED AND DRAWN 1906-1909. CYRIL KEELE.

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NIEUPORT-VILLE, THIELT, TERMONDE, AERSCHOT, HERENTHALS, &c.

IMPRESSIONS OF A DART-ABOUT TOUR WITH A BELGIAN "SEASON."

By JOHN A. RANDOLPH.

NOT having renewed our acquaintance with Termonde since the beginning of 1887, with which architectural jewel-casket we had pleasant memories, we deliberately included it in a recent zigzag jaunt (with a five-day season ticket) in Belgium.

Perhaps zigzag hardly conveys an adequate idea of our outing, which we had undertaken with the intention of revisiting towns favourite with us from twenty-five to thirty years ago, and of getting in a few "new" ones into the bargain. As far as possible we succeeded in going over little ground already covered, but in "getting there," in most cases, by new routes. This we were enabled to do with the aid of a large railway map of Belgium on geographical lines (now out of print, and replaced by an almost misleading "straight-line" map on a much smaller scale and quite useless for our purpose). Our old map is heavily scored with a thick line along the routes already covered, and the towns and villages visited underlined, which materially helps us in planning tours in that country.

Our route lay by "light railway" from Ostende to Furnes, *via* Nieuport-Ville; thence by State railway with our five-day "season" to Dixmude, Thielt, Courtrai, Audenaerde, Renaix, Alost, Termonde, Malines, and *via* Antwerp to Herenthals, Aerschot, Lierre, and back to Antwerp; thence to St. Nicolas (where our "season" expired), Ghent, Bruges, Zandvoorde, Ostende, Ghistelles, and back to Bruges. Thence next afternoon, by train, *via* Thourout and Roulers, to Ypres; next day to Hazebrouck, and the following day to Maidstone, *via* Calais and Dover, and "home" by Croydon.

As per our custom when touring abroad, we were off early from Ostende—7.30 A.M.—by light railway (from alongside the town station) for Nieuport-Ville, along the straggling road parallel with the Digne, passing through Middelkerke and Westende, the middle and western sites of the property of the old Abbaye des Dunes, the eastern end of which was close to Ostende. The driver of the steam tram—for such it is—operated almost unceasingly on the motor horn and it almost got on our nerves after an hour of it. On alighting, we passed over the boulders—glorified cobbles!—to the picturesque square, where on the further side the handsome Halles, with its bold set of cusped arches, harmonises so well with the square and lofty slender tower. Close to, with the entrance reached under a group of trees, is the most interesting Gothic church imaginable, but with a heavy and ungainly low square Renaissance tower on its north side. In the interior some unusual "blind tracery" and blind arches appear on the walls of the turrets; at the crossing, a rood loft, and construction items in the way of monuments and brick-traceried and other windows, call for a place in an architect's note-book.

The hospital and its chapel, the town hall, the post office, and one or two other interesting specimens, all near together, deserve more than the passing attention of the visitor.

In about another hour, after passing through Nieuport-Bains, we reached Furnes, with its monument-lined Grande Place. Our fellow-passengers for this run, right up to the branch for La Panne, were a noisy and redolent crew of fishermen and boys, some in sabots, some barefooted, with sacks of some mysterious stuff, and baskets and network bags of fish! Being the end of July, we had taken up our position on the outside platform at the end of the train, for the atmosphere from the inside when the door was opened and after they left was terrible, and the floor still worse, in spite of warnings not to offend!

Since our last visit to Furnes, some twenty-seven years ago, the transept of St. Walburge's Church has been built, but the dilapidated stone west doorway is boarded off at a respectful distance, and there is no nave. St. Nicolas's Church, more remarkable for its huge tower than for the disappointing architecture of the church itself, is close at hand on the other side of the square. The charming town hall and belfry, two Bruges-style gables, and a delightful turret cluster together near St. Walburge's, and there is an apsed chapel-like structure at the rear of the belfry, visible from the recreation ground alongside the site of the nave of St. Walburge's.

Near the square is a hostel boasting an honoured and historical name, the "Noble Rose"; but a recent lawsuit has shown that it is not entitled to the name.

The two corners of the square, as one comes into it from the station, are of great architectural interest, as also the house in another corner with an arcading open to the Place.

Our next halt, now using our "season," was Dixmude, with which place we were disappointed, though we were well rewarded by the majestic church with its wonderful screen. The town hall is modern, and as the original plans were stolen much of the design was copied from the handsome new one at St. Nicolas, designed by a pupil of the celebrated Ghent "School of St. Luke."

The time-tables revealed the fact that we could not get beyond Deynze that night, though it was only five o'clock when we had done with Dixmude; so we elected to stop short at Thielt, a place we had long wanted to see, and we congratulate ourselves on having done so.

There is a horse tram from the station to the town's Grande Place, along a tedious mile of nondescript half-town, half-village street; we had to walk it, and met the vehicle on its way to the station. When we got to the entrance of the small, irregularly-shaped Place, what purported (*vide* Baedeker) to be our hotel faced us. However, we suddenly became aware of the existence of a singularly picturesque isolated belfry a few paces away, and made for it first, a sweet little chime at that moment clanging out a merry tune for half-past eight. This was so delightful a surprise that we put down our hand luggage and listened. When it was over we at once made for the "Plume d'Or" (the "Plume" in Baedeker), but we were disconcerted to find that it was no longer a hotel, but only a café; however, the good people referred us to the "Espérance," a few steps further down, opposite the Belfry, and said they would be grateful if we made it known that the "Plume" no longer took in guests, as they had been obliged to turn away a number of intending visitors. We found ourselves very comfortable at the "Espérance," and the people quite charming and most attentive to our requirements, even putting themselves out, as it was a Saturday night and the shops closed, to fetch us during our supper some picture-cards of the Belfry and of any other monuments the town might possess, as we were off again soon after early service at the church next morning.

The Belfry has a little arcading round three sides and the caretaker's rooms over the arches. It is not very lofty, but it is elegant, and has a cluster of bells in the open just under the finishing roof of the quaint spire. The chimes play every quarter of an hour, and at 10.50 P.M. the curfew rings out for a few minutes, as all cafés and similar establishments have to be closed and lights out by eleven, under penalty of a fine.

Next morning to early service in the interesting long and wide church. The tower is central and octagonal, with very lofty slated spire. After breakfast and a daylight examination of the Belfry, we took the horse tram to the station to train to Courtrai. At Deynze we had to change, but unfortunately no time was given us to get into the town (or large village) to see its two fine churches, one of which has much pre-Gothic work.

A few minutes before reaching Courtrai our train passed close to a gigantic Byzantine tower (surmounted by a Renaissance flèche) at Harlebeke. The tower has many storeys with pairs of small double lights in each under a round arch, and the effect is most striking. We were able to get some cards at Courtrai in the course of our explorations, but, to our surprise and discomfiture, none of Harlebeke's grand tower. But we secured some of the old barracks, near the post office, and of the sweet little weigh-house near the stiffly-restored town hall.

Presently we were *en route* again to Sottegem (passing Audenaerde), where there is a visit-worthy Gothic church with a Renaissance small tower with chime in the open; and then returned to Audenaerde for the night, to renew our acquaintance with the place after an absence of twenty-five years. Next morning, after photographing and buying cards, our itinerary lay *via* Sottegem (by another route) to Alost, taking in Renaix, which we saw last in 1880, and where our friend Mr. Henri Geirnaert, of Ghent, a former pupil of St. Luke's School there, had recently restored the crypt of the great church.

There is not much to see at Renaix, which we reached through lovely country, especially pretty at Marie-Louise, whence a general view of the town may be obtained. The broad road from the station at Renaix leads at the bifurcation, some ten minutes' walk away, to the right and down hill, to the fine church of St. Hermes, with its graceful steeple, gabled and crocketted south aisle with rich traceried

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windows and crypt, which is worth seeing. A few steps off, before reaching St. Hermes, is the dilapidated St. Martin's Church, now a timber store, with Early Gothic tower at the west end. A new church to the Saint, of exceptional excellence internally but nothing much to look at outside, has been built nearer the station. The town hall, in the corner of the Grande Place that lies a few yards off the main street, is unpretentious, with a little bell turret.

Our train Alostwards passed up a steep gradient and through wooded country to Sottegem, but flatter nearer Alost, with interesting churches *en route*. At the Hôtel des Arcades, at Alost, alongside the station, we had time for a snack before our train on to Termonde. There were great engineering works in progress here, the raising of the track being in progress in order to enable vehicular cross traffic not to be impeded. Before we reached Termonde the graceful Norman central-towered church, with lofty spire, of Audegem came into view. It must have been quite thirty years since we had seen it last and sketched it. The road from the station at Termonde to the Grande Place seemed longer than what we remembered it to have been. At the bend a huge red-brick and blue-stone stiff Gothic church with twin steeples, built by the Benedictines, met our gaze. It is absolutely out of keeping and proportion with anything in this charming town; it is aggressive and we might almost say vulgarly self-advertising. At last we reached the Grande Place—the smallest in Belgium—but to our horror and dismay we found that the fine old and browned Renaissance stone gable, just the other side of the town hall's charming belfry, had been pulled down, and a brand new stiff Gothic flaring white one erected in its place.

What can the "Commission Royale des Monuments" have been about to allow such an outrage to be perpetrated? A body, too, that is such a stickler in its requirements with regard to even new stained-glass windows or paintings for churches.

Some "restoration" was going on at the interesting old church near, with its curious octagonal central tower; and after what has been done at the town hall we confess to feeling anxious and sceptical.

Our train to Malines was twenty-four minutes late starting, having to await the previous passage of the Cologne express from Ostende; however, we did the finest piece of hustling that has been done for many a long day by "slow" train on the Belgian railways, and reached Malines, nominally an hour's run by "slow," at the stipulated minute. It was magnificent!

One disappointment we had in Malines, which city we know very well, was that we were unable to get a picture-card of Notre-Dame Church, whose grand apse is such a striking feature from the bridge between the station and the Grande Place. The remnant of the beautiful old house just beyond the picturesque Halles has made room for a vast structure (out of all proportion to the other buildings on the Square), with detail and design closely akin to that of the Gothic part of Ghent town hall. It is the future central post office, but the interior will not be ready for another year and a half, though the exterior is finished.

Next morning, after changing at Antwerp, we alighted in a part of Belgium obviously under Dutch influence architecturally, and where we had never been before—Herenthals, where, to get to the centre of the straggling town, we had to follow the line of the ubiquitous steam tram, through a long winding street of low poor houses, almost an unbroken line of roof from end to end. The Place is the very wide finish to a wide street. A small isolated town hall, with its old roof undergoing renewal, and its small louvres giving place to three huge ones with heavy three-cusped arches on their fronts, and a lofty chime-crowned octagonal turret and stepped end gable of dark red and white stone in effective lines—gable and turret being ornamented at frequent stages by tiny arcading—stands at the lower end of the square and close to the street we emerged from. Turning to the right, the first street on the right brought us to the imposing rich Gothic church with lofty steeple, but minus the apse (burned down one hundred years ago). Internally there is a good deal of constructional curiosity to be noticed, including, on the turret from the north choir aisle, an elongated bracket representing a diminutive man on his back, kicking and throwing up his hands. In a chapel in that aisle is a perfectly preserved oak carved altar-piece of the late fifteenth century or early sixteenth, with a vast number of small figures, and the tabernacle work is exquisite.

Our next move was to Aerschot, whose huge church and colossal steeple are so impressive. The screen there was disappointingly poor after Dixmude, and the Crucifixion group above it but a feeble modern imitation of the work below. The fine old paintings in the Blessed Sacrament Chapel should be noted. The whole interior has been "skinned," revealing the red brick and white stone lines right up to the roof, as also alarming rents or deep cracks all over the surface. Now money is wanted to make the whole safe and restore the pointing. The window tracery and the outside aisles are very fine, as also are the long narrow choir windows.

On our way thence to Lierre we caught sight of another grand church, with lofty tower and spire rising majestically from the summit of a hill at a short distance from the railway. Unfortunately we did not know of it before leaving Antwerp in the morning, or we should have made a point of alighting and of passing a night there rather than at Antwerp. Our "season" would have enabled us to do so, but we were due at Ghent by appointment on a certain day, and had planned our tour accordingly. This fine church on the hill is that of Heyst-op-den-Berg.

We were late arriving at Lierre, and had to hasten to get to St. Gomaere's great church, for it closed at 7 P.M. The screen there is more pleasing than Dixmude's, for it is less crowded with foliage, and is not quite so "cut up," and is of better proportions to the church enshrining it.

Hastening stationwards across the Grande Place, we scrutinised the eighteenth-century town hall, with its elegant tower of 1369, the several old houses on the square—a tall stone one reminding us of a smaller one in the Rue d'Argent at Bruges, close to the cathedral—an old wrought-iron sign, and two old chapels near the town hall and church.

The trams that took us from Antwerp station to our abode for the night opposite the Pays de Waes station cannot be favourably criticised. The cars are ridiculously short and light, are driven at a furious pace, and plunge up and down disgracefully. Only at notoriously dangerous corners do the drivers slacken speed, all other corners being negotiated far too fast, and the cars are stopped and started with quite terrific suddenness. Such reckless driving would not be tolerated in England.

A few minutes before we were due to start for St. Nicolas, next afternoon, a tramwire of the overhead system snapped with a loud report as a car passed the hotel door, and fell with loud crackling and shedding of huge flakes of fire as the "arm" slipped along the falling end. The passengers and passers-by stampeded but were, luckily, uninjured.

The conductor immediately rushed in to the telephone at the hotel and the current was cut off within three minutes, and in just a little over five a staff of repairers was at work on the break, and when the two ends were temporarily adjusted the current was turned on again, and the string of cars waiting to go to the Steen were driven onwards to well clear of the break by lowering the "arm" there momentarily, and were thus able to continue their journey. We left the men at work, surrounded by a gaping and interested crowd, many of whom were in blue smocks and sabots. What a subject they had now for café gossip!

St. Nicolas, where we gave up our "season" in return for the 5 francs deposit (having actually saved 2*s.* 6*d.* in train fares), as we were going no further that night, and our five days expired at midnight, has, besides its handsome town hall, an interesting old church with octagonal central tower and spire, a fine browned stone seventeenth-century house, a museum, and the post-office almost next door, all close together on the square on which our hotel looked; also a nice house with an old turret and charming grounds belonging to the venerable doyen, and a little park near the station, with some handsome new shops in the immediate vicinity.

As to Ghent, where we stayed two nights with some friends, we need mention only one or two items—the new post office, taking up half the side of the Marché aux Grains, opposite to St. Nicolas's Church, with its extraordinary clock-tower peering over the roof from somewhere behind and its stiff façade towards the canal, in sharp contrast to the Maison des Bateliers and old houses adjacent, is now finished externally, and is probably now in use. Some charming old Renaissance gables have vanished to make way for the concern, and the narrow Rue de l'Etoile has been wiped out. Alongside the building is the heavy and wide stone bridge, with a hideous hump in the middle for barges to pass under, and, on the further side, the ancient Sacristy of St. Michael's Church has gone, as also the Curé's house which adjoined The quay passes through an arch under the bridge, and is approached therefrom by a flight of steps.

The annual exhibition of St. Luke's School, in the Rue d'Angleterre, near St. Michael's Church, was open when we were there, and we were most struck by the heraldic designs and the freehand sketches of architectural tit-bits (including the town hall turret of Lierre) on half-sheets of paper of various hues and sizes and styles.

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On Bruges we need not expatiate, but will say that we were met, by appointment, by the genial proprietor of the Zandvoorde Brick and Tile Works, to which we motored in his luxurious auto-landau, and were shown over them and the various methods of manufacture and baking, and the furnaces, on top of which we stood and looked down through one of the little stoke-openings into the miniature inferno below. After lunch at Ostende, barely a mile from Zandvoorde, we motored to Ghistelles and saw and photographed the church there, whose lofty spire has been restored in bright yellow brick!

On to the new and immense "Hospice St. Julien," outside Bruges, a few hundred yards from the Porte Maréchale there. It is designed by Mr. Coomans, of Ypres, in the Bruges style, and has been erected in the pink bricks produced at Zandvoorde, which are so deservedly popular. The firm had to supply by mid-July (the order was received at the beginning of April) the huge total of 12¼ million bricks for the structure, which was in progress while the supplies were being delivered, and nearly complete at our visit on August 1. This big order was executed in addition to others in hand (some for England) to the extent of over four more million. We motored back to our meeting-place, and, after a short stroll round by and inside Notre-Dame (to see the restorations in progress) and the Dijver, parted company.

At ten o'clock next morning we were at the parish church of our early days in Bruges—St. Walburge's—where the singing has terribly deteriorated of late years. In the afternoon to Ypres, where we met crowds making for the trains after their witnessing a great historical and jubilee procession commemorating the 525th anniversary of the liberation of the city.

Our old hotel of 1880 is now a private house, but we found a comfortable one near the station. Next morning the Kermesse began, and we plied our kodak energetically. Late in the afternoon we trained to Hazebrouck, passing Poperinghe and Vlamertinghe churches, with their massive and superb towers, in close proximity to the line.

French soil was at length reached, the Customs officer being uncertain for a while whether he ought not to keep back a few of our picture-card packets, they being so suspiciously numerous as to make him surmise we were in the stationery trade!

The steeple of Hazebrouck Church is handsome, and near it is a nice-looking two-gabled Renaissance structure. The Grande Place, atrociously paved, is oblong and large, approached from the station side of the town by steps through an arch between the town hall and the prison and other municipal buildings, with a fine colonnade running along their fronts to the Place. A few years ago there was a charming little Préfecture, with wrought-iron gates; but building and gates have vanished in favour of a much-painted very French "Joli Villa" affair, with very poor cast-iron gates.

The rest of the journey was *via* St. Omer, with its two amazing churches, to Dover, whence, after much deliberation over time-tables and fares—whether it should be Guildford or Maidstone for the night—we definitely made for Maidstone, and put up, like Pepys, at the "Bell." Of course, the weather failed us next morning, and our twelve photos were all under-exposed owing to the bad light and heavy overcastness, which turned to drizzle, which lasted till our arrival in the evening at East Croydon, where it came on to rain in grim earnest, while we were making our way to West Croydon Station, twenty minutes walk, in order to train "home."

We were delighted with Maidstone, where we had never been but often planned to go, so that was the chief reason of our selecting our last night to be there rather than at Guildford, which we know and love so well. And the scenery and antiquities between Maidstone and Paddockwood were a delightful finish to a delightful tour.

ROMAN BOAT DISCOVERED ON NEW COUNTY HALL SITE.

IN the course of excavations on the site of the new L.C.C. county hall a discovery was made a short time back of which the Local Government Records and Museums Committee now report that the importance from an historical and archæological point of view can hardly be overestimated. The principal feature of the discovery consists of a Roman boat. As this is a unique example of such a find in Britain it is of greater interest even than the clinker-built boat of King Alfred's time, discovered at Walthamstow a few years ago, and of other Viking boats found in various parts of the kingdom. A considerable portion of the vessel, which is of oak, is still covered, and until the earth is removed it will not be possible to ascertain its exact size, but so far as can be judged the vessel would seem to be about 50 feet long and 16 feet beam. Several articles were found in the boat, comprising some sherds of Roman pottery, bones, iron nails, glass gaming buttons, iron-studded soles of footwear, a coin of Tetricus in Gaul (268-273), a coin of Carausius in Britain (286-293), which is stated by the keeper of coins at the British Museum to be of date 290 or 291, and a coin of Allectus in Britain (293-296), and these objects are stated by the authorities of the geological museum to be the safest evidence as to the age of the boat, which may therefore be assigned to the end of the third or beginning of the fourth century A.D. Dr. C. H. Read, keeper of the department of British and Mediæval antiquities at the British Museum, who has examined the boat, points out that the discovery is of special interest and value as having been made on the Council's own property on what must have been the bank of the river in Roman times, and expresses the opinion that the vessel is capable of preservation.

The committee are strongly of opinion that this interesting and valuable relic of a former period of London history should be carefully preserved as an important item of London antiquities. The boat, if preserved in a suitable position for exhibition, will prove a valuable acquisition for London, and the example which the Council is enabled to set will probably not be lost upon other authorities.

They are advised that the relic should be housed in a building of the Dutch barn type, since the open air will be the best situation for it, and that a screen of wire netting should be placed round the exhibit to prevent damage by relic hunters. They are of opinion that, eventually, the boat should be housed on a site in the vicinity of the new county hall, but for the next few years a suitable site can be found for it either in the open space behind the Horniman Museum or in the Horniman Gardens, where it will attract the attention of visitors and form an exhibit of the highest value. The estimated cost of the removal and carriage of the boat and the provision of a suitable shed is 200*l*. There is no provision in the annual maintenance estimates for this expenditure, and they have asked the Finance Committee to submit a special maintenance estimate of 200*l*. to cover the cost of the necessary works and the provision and fitting up of the shed.

A DU MAURIER EXHIBITION.

AT the Leicester Galleries, Leicester Square, W., there is now on exhibition a collection of over one hundred and fifty drawings by the late George du Maurier. A strong connecting link runs through them, inasmuch as they have been selected with a view to illustrating "society" in late Victorian times. This fact necessitated the exclusion of work on which the chances of the continuance of the artist's reputation with the rising generation must chiefly rest. Du Maurier, who joined the staff of *Punch* in 1864, was producing work as recently as 1896. Yet the weekly caricatures, if we may so call his contributions to the great laughter-maker, were by their character perhaps intended for the moment rather than for the future. Of a somewhat different intention were his illustrations to "Trilby," a book which makes as strong an appeal to-day as it did on the day of its production. Fortunately the line was not so tightly drawn by the organisers of the present exhibition as to exclude two small studies for the "Trilby" illustrations, and with these the visitor must rest content. They possess a spontaneity missing in the three illustrations to "Esmond" which are also shown. These book illustrations have the advantage of a literary interest as compared with the chiefly topical interest of the remaining drawings. There are, however, besides those just mentioned, at least two works which make a direct appeal independent of their letterpress. Neither of them is illustrating a joke; one is called "A Fantasy" and the other is "At the Piano." These two afford a welcome change to the delicate humour which surrounds them. The first is a delightfully grouped composition, in which perfect balance combined with the homely refinement of the sitters produces a most pleasing tout ensemble. The second shows a lady sitting at a piano conjuring up pictures of young children. It is said to be a portrait group of the Du Maurier family; if so this accounts for the substantiality of the imagined shapes. Another drawing which needs no humour to reinforce it is "La Procession Dinatoire"; here the descending couples are arranged with great decorative skill.

The exhibition however is, as we have already said,

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intended to show the foibles of late Victorian society. The drawings range between the years 1874 and 1894. A good number of them relate to the æsthetic craze of thirty years ago. Mr. Du Maurier waged merciless war against its most advanced disciples, who were, however, not altogether to be blamed for the violence of their reaction against previously accepted standards. The *Punch* artist hoped, no doubt, to kill their eccentricities by ridicule; yet it is whispered that he actually encouraged the movement. Mr. F. Anstey, in his appreciation in the catalogue, remarks that Du Maurier was the first to note the rise of the æsthetic school, and, he says, "no other living artist could have exposed the extravagances and affectations of its typical votaries, the ineffable Maudle, Prigsby and Jellaby Postlethwaite, with such delicately effective ridicule." Closely allied to these were the Chinamaniacs, a young follower of which body is shown crying because he had been given his cod-liver oil out of a plain white mug. Then he was unsparing of snobs, nouveaux riches and toadies. Mingled with all these are drawings which have a humour as rich and apropos to-day as they had when first produced. It must be confessed that the exhibition suffers especially from a lack of variety in the types shown and from the difficulty of enjoying a hundred and fifty jokes fired off in rapid succession. The second was inevitable, while as to the first Du Maurier was careful to keep within his limitations by not straying for subjects far afield from the set in which he moved. Each drawing repays careful attention, for each was prepared with elaboration, and this it is difficult to give under the present conditions.

SOME ASPECTS OF THE HOUSING AND TOWN PLANNING ACT, 1909.*

FEW measures affecting public health have awakened more widespread interest among all persons interested in Local Government than the Housing and Town Planning Act passed last year. It survived all the trying ordeals incidental to party government, and by mutual concession and compromise has been placed on the Statute Book in a form little differing from that in which the Bill was originally introduced. Fortunately, our public health legislation has hitherto escaped much of the virus of party animus. Since Disraeli's famous parody on the Scriptural seer, "Sanitas, Sanitatum omnia Sanitas," in 1875, each party has vied with the other in legislative efforts to improve the health of the people. The Public Health Act of that year is the sure foundation on which all subsequent legislation has been based, and remains the Health Charter of our Constitution.

While it may be true that people cannot be made sober by Act of Parliament, the experience of the past thirty-five years indicates that they certainly can be made healthier by that means. Indeed, looking at the reduction in the death rate and that of zymotic diseases, and without casting any aspersion on a noble profession, it is probably not too much to claim that Parliament in the last generation has saved more lives and prevented more sickness than all the doctors from Hippocrates to Sir Lauder Brunton. And this has occurred at a time when rural life, with all its healthy features, was declining, and towns growing in magnitude with startling rapidity. Had the town rate of mortality at the middle of the last century continued to the present time, it is appalling to contemplate what a harvest death would now be reaping in our cities. And in acknowledging the admirable work of the leading sanitarians of to-day, a word of appreciation is due to those pioneers of forty or fifty years ago—Sir E. Chadwick, Sir B. W. Richardson, Lord Shaftesbury, and others—to whose zeal and pertinacity the first legislative efforts were due.

The Housing and Town Planning Act of 1909, although containing many new features, is, to a large extent, merely the dotting of the i's and crossing of the t's of previous enactments, particularly the various Housing of the Working Classes Acts.

It is divided into four parts:—

The first confers powers to improve existing buildings and to secure new dwellings for the working classes, and is an extension of the Housing of the Working Classes Act, 1890.

The second contains the important novel provisions with respect to town planning.

The third requires county councils to appoint medical officers and to establish county public health and housing committees, and to assist building societies.

The fourth contains protective clauses for commons, open spaces and land near royal palaces and parks, and provide for the repeal of certain enactments rendered obsolete by the Act, but for the purposes of this paper the author prefers to deal with the Act under four prominent aspects, which he will describe as the destructive, the constructive, the ideal, and the administrative.

In this is included all the sections dealing with improvement schemes and reconstruction schemes under Parts 1 and 2 of the principal Act, the demolition of obstructive buildings, and the inspection of the district required by the Act. All of these aim at the destruction of existing conditions and form a most important feature. The first notable change is that of increasing the liability of owners by the condition that there is an implied contract with the tenant that all houses let after the passing of the Act at rental values—in London not exceeding 40*l*., in towns with a population of 50,000 and upwards 20*l*., and elsewhere 16*l*.—are reasonably fit for habitation at the commencement of the tenancy, and must be kept so. A similar clause existed in the Housing of the Working Classes Act, 1890, but the limits of rent have been considerably raised. Why there should be any limit is difficult to determine, and limiting the liability to houses let after the passing of the Act seems somewhat unreasonable.

The sections of the principal Act for the clearance of large unhealthy areas in urban districts are considerably strengthened, and on the clearance of a slum area there is an obligation on the local authority to provide an improvement scheme or re-house the persons displaced. Cellar dwellings are also defined as dwelling houses, and made subject to regulations, and by-laws applicable to houses let in lodgings can now be enforced on the owners. Obstructive buildings and back-to-back dwellings are also dealt with. In the former case additional powers are given for demolition, and the latter, which are such a serious blot in many of our northern towns, may not be erected except the medical officer of health certifies that all habitable rooms are effectively ventilated.

The procedure for closing order and demolition of unfit houses is made much more drastic. Instead of the long and tedious process with which many of us are familiar, the local authority is now made the judge as to the fitness of premises for human occupation—subject to the right of appeal to the Local Government Board. A closing order will now become operative within fourteen days of the service of the notice, without the necessity for any magisterial proceedings. Similarly, in the case of demolition orders, the local authority, subject to appeal to the Local Government Board, can act summarily. These powers should, of course, be exercised with tact and discretion, but the simplicity of the procedure is a great advance on the former cumbrous and unsatisfactory method.

Systematic inspection to enforce the Act is made compulsory on local authorities under section 17, and can also be exercised by landlords and their agents. The Local Government Board may prescribe a form of record for the results of inspections carried out by the local authority, and it is to be hoped they will do so, as in many districts they are likely to be of a perfunctory nature.

My friend, Alderman Thompson, the chairman of the National Housing Council, is of opinion that "inspection is the essential foundation of all housing work," and doubtless he is right; but with the meagre and ill-paid staff at the disposal of so many authorities, the kind of inspection he contemplates is out of the question. Nevertheless, sufficient has been indicated to show that local authorities are now invested with wide powers for dealing with insanitary conditions which extend far beyond the old conception of "remedying a nuisance." There is no longer any necessity to prove a statutory nuisance to close a dwelling as unfit for human habitation. The broader and more common-sense view has been taken, that any circumstance or combination of circumstances which causes a dwelling to be prejudicial to the health of its inmates or other members of the community is, ipso facto, a sufficient reason for the governing body's interference. This would probably have appeared high-handed to the last generation, but public opinions move quickly; now more than ever is "Salus populi suprema lex."

Having dealt with what I have termed the destructive feature of the Act, we now come to the no less important clauses dealing with the provision of new dwellings, and here again, in the main, the Act is an amplification and extension of Part III. of the 1890 enactment.

So far as rural districts are concerned, Part III. of the 1890 Act has been an abject failure. In the course of twenty

* A paper read by Mr. T. C. Barralet, member, before a Southern District meeting of the Institution of Municipal Engineers at Brighton, June 18.

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years scarcely more cottages have been built under the Act in rural districts. The causes of its failure are familiar to most of us—adoptive nature of Act, cumbrous and costly procedure, early repayment of loans, absence of compulsory powers for the purchase of land, hostility of county councils. All these and many other reasons sufficiently account for it. In towns, of course, much in the way of housing has been carried out—some wisely, some otherwise.

The Act of 1909 sweeps away all limitations and restrictions, so far as rural districts were concerned. It is operative throughout the country. Land may be compulsorily acquired, streets may be made, loans for land may be extended to eighty years, on buildings to fifty years. Co-operative and other societies may be financed, and in every way facilities are provided for any local authority to carry out this part of the Act.

The Act does not say that it is the duty of local authorities to provide houses for the people, but it does imply that it is the duty of every local authority to see that every human being in their area is properly housed, and that, failing any deficiency being provided by private enterprise, it shall be supplied by them.

Without going into the vexed question of the proper limits of municipal work, it may be admitted that prima facie dwellings can be better provided by private enterprise than by a local authority. In towns the law of supply and demand roughly brings about a supply of houses when they are needed. Builders build for profit, and the larger wages prevalent in towns are sufficient to return a reasonable interest on their outlay. In many rural districts it is different. The rent an ordinary agricultural labourer can afford to pay out of his scanty earnings may be taken at 2*s*. 6*d*. a week, or 6*l*. 10*s*. a year. After deducting for rates and other outgoings, the owner of the house would receive no more than 5*l*. a year, or sufficient to pay 5*l*. per cent. interest on an outlay of 100*l*. Now, we know that 100*l*. is not sufficient to decently house a labourer and his family. Hence, in such places as I have indicated the law of supply and demand will never solve the housing question. It is true that many benevolent landlords build excellent cottages for their tenants which pay them a bare return on their outlay; but these are exceptional cases. What, then, is the alternative? Even philanthropic or co-operative building societies cannot be carried on at a loss, and if it is a good thing for the nation to keep a race of sturdy peasantry on the soil, it seems fair that the nation should pay for it. Most of us are agreed that the depopulation of the countryside is a deplorable fact, and that the hovels in which some of the poor are forced to live are a disgrace to civilisation; but we hesitate about collective action. There is no such hesitation if it is a matter of a hospital, an infirmary, or workhouse; yet it is possible that the provision of decent cottages might sometimes render these institutions unnecessary.

Let us take a concrete case (and there are many such in the country) of a dozen squalid cottages—hotbeds of diphtheria and typhoid fever—which the local authority hesitate to close because there are no others. They have built a fine isolation hospital at a cost of 5,000*l*., and run it at a cost of 1,000*l*. a year; in which there is generally an inmate from these cottages, costing the ratepayers about 15*l*. a head. Supposing, under this Act, the council determine to close the hovels and build twelve decent cottages at a cost of 2,000*l*. Under the extended period for loans the repayments would work out at about 100*l*. per annum, to which should be added 25*l*. for rates and outgoings, making a total of 125*l*. per annum. Against this the rents at 2*s*. 6*d*. per week would produce 78*l*. a year, a present net loss of 47*l*. a year; though at the end of the period of repayment this would be converted into a profit of about the same amount. The net result would be that for an outlay of 47*l*. a year a fever-stricken slum would be abolished and fifty persons healthily housed; it is also reasonable to suppose that there would be more vacant beds in the hospital and infirmary, and the working power of the cottagers considerably increased, so that they are less likely to be applicants for Poor Law relief. It is not improbable that even 47*l*. a year would be a high price to pay for such advantages in many poor districts, and in such cases, regarding the question as an Imperial one, the Treasury might reasonably be asked to make good any loss beyond, say, a halfpenny rate.

On the other hand, it will be allowed that there are many rural districts where no loss need be anticipated—mechanics in such places are equally in need of sufficient housing as agricultural labourers, and are able and willing to pay a rent that would be sufficient to cover all outgoings under a housing scheme.

I have dealt somewhat at length on this aspect of the Act because rural life is familiar to me, and I am satisfied that urgent steps are needed to prevent the disastrous emigration to the great towns, which is among the most fruitful causes of unemployment. The re-housing of persons displaced by an improvement scheme has already been lightly touched upon. The obligation to re-house only takes effect if thirty or more persons are displaced under the Housing of Working Classes Act, 1903, and the Act under consideration prescribes that in London provision shall be made for not less than half the population displaced, unless it can be shown that there is or will be adequate provision in the immediate vicinity, and in other urban districts such accommodation (if any) as shall be required by the Local Government Board.

The most interesting part of the Act to municipal engineers is unquestionably that relating to town planning. Some of the germs of it were contained in the Public Health Amendment Act of 1907, but the Act of last year is a definite attempt to give local authorities a determining voice in the development of their districts. Hitherto our towns have sprung up in a sporadic and spasmodic manner, each individual owner following his own sweet will as to the direction of streets, the class and situation of houses and shops, and the provision of open spaces, without any regard to general utility or the development of adjacent land. The guiding idea has been profit, to provide the maximum of frontage at the minimum of outlay, and to crowd as many dwellings on an acre of ground as the local by-laws will allow.

No doubt there are exceptions where a public-spirited landowner has been actuated by more lofty considerations, such as the Duke of Devonshire at Eastbourne, Mr. Lever at Port Sunlight, &c., but taken as a whole our modern towns have sprung up without any guiding central idea or control, and as a consequence are unlovely and uninteresting.

The old towns of the Middle Ages are beautiful, not so much for their planning as their quaint architecture. Yet even in them there is more form and unity of plan than in the modern manufacturing town. Take any of the old cities of Flanders or Germany, or our own old towns like York or Winchester; in all cases there is an unmistakable centre, from which all the main thoroughfares radiate. The grand place or market place, and the custom in ancient times of each trade to inhabit its own quarter of the city help to give that distinctive and indescribable charm which we all feel on beholding them.

The haphazard growth of the town of to-day is marked by miles of mean streets and mean houses. Narrow causeways where there should be broad boulevards, acres of ugly and expensive macadamised roads where leafy avenues would have served so much better, shoddy shops put up "on spec" where there are no customers, and houses dumped in a waste where there are no shops.

Millions of pounds have been spent by municipalities in recent years for widening roads, removing obstructive buildings, providing open spaces and recreation grounds—much of which could have been avoided if the town had been laid out by a central authority in the first instance. Late in the day comes these town planning clauses, admittedly an importation from Germany, the country par excellence of centralised government. They constitute an entirely new departure in British legislation, and it will be interesting to see how John Bull with his strong views on individual rights takes to them. The local authorities to administer the Act are—for London the L.C.C., and for the provinces the various town, urban, and rural councils, with power to co-operate between each other. Schemes may also be prepared by landowners themselves, which the local authority has to accept on the fiat of the Local Government Board, who in their circular urge the various local authorities, and very rightly, to co-operate with the landowners.

The objects of town planning are set forth as for "securing proper sanitary conditions, amenity and convenience in connection with the laying out and use of the land or any neighbouring land." It will be noted that there is no power conferred on local authorities to deal with sites already built upon; only land, and not buildings, is included in the Act, hence the Act is not expected to remedy the errors of the past, but rather to prevent their recurrence in suburbs and towns of the future. To this object the local authority may purchase land either by voluntary agreement or compulsorily for a town planning scheme, either within or without their area. These are obviously necessary conditions. The success of town planning in Germany is mainly due to the fact that the municipalities themselves are large landowners, and can therefore prescribe the lines of future development.

The first essential in town planning is traffic requirements; equally needful is the preservation of natural beauty and the creating of sightly and healthy buildings. Our present code

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MODERN EUROPEAN ARCHITECTURE.

AUSTRIA.



[From *Der Architekt.*

POST OFFICE, WIENER-NEUSTADT.—Herren THEISZ & JAKSCH, Architects.

of building by-laws is of little use in these respects. At present we possess no standard of width for main arterial roads, and in many populous districts 36 feet is the utmost width that can be enforced, where double that width would not be *too* much. In the Prussian Town Planning Act owners of land abutting on streets included in a town extension plan are required to give up sufficient land to widen the street to 85 feet, and to pay the whole cost of its construction. In Britain the maximum that can be insisted on without compensation is 60 feet at Edinburgh and 54 feet at Salford. I have since heard that a recent local Act allows 80 feet in Liverpool. A planning scheme, however, is to a large extent independent of by-laws, and much will depend on the interpretation which the Local Government Board put on the expressions, "sanitary conditions," "amenity," and "convenience" when schemes are submitted to them. In fact, the whole success or failure of this part of the Act hinges on the Local Government Board. No scheme can be initiated without their sanction, and they alone have the power to determine its minutest details. Perhaps this is inevitable in following a German model; but it is somewhat antagonistic to our old ideas of local self-government.

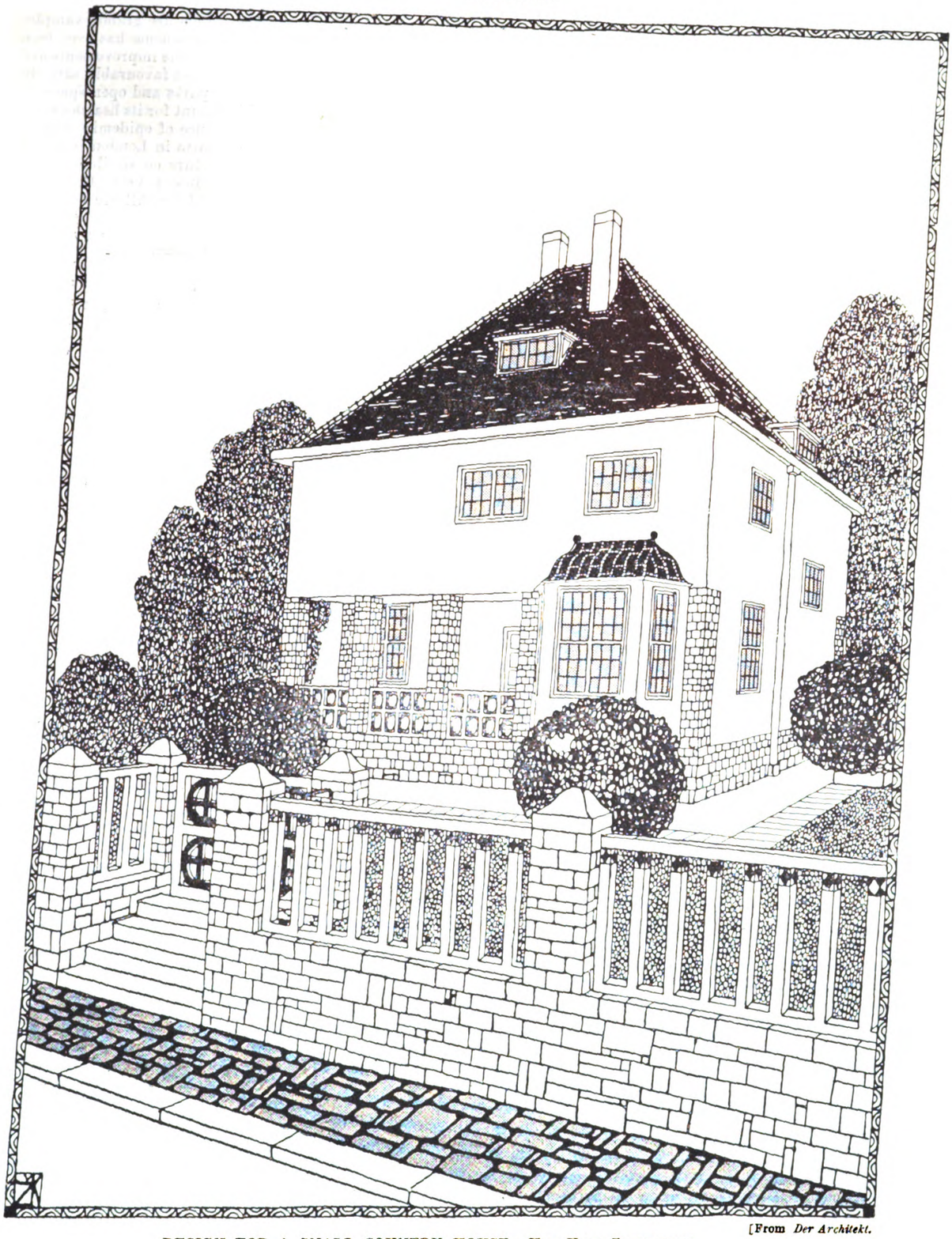
It must be conceded that the Act covers a wide ground in defining the things that are to be taken into consideration in formulating a scheme. In addition to the construction of streets alluded to, we have the limitation in number, height, and character of buildings; the provision of open spaces—public or private—the preservation of objects of historic interest and natural beauty; sewerage, lighting, water supply, and the removal of obstructive buildings—of course with compensation; in fact, the word compensation appears with somewhat alarming frequency.

And where does the function of the municipal surveyor come in in all this? He is not mentioned at all, but pre-

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MODERN EUROPEAN ARCHITECTURE.

BOHEMIA.



[From *Der Architekt.*

DESIGN FOR A SMALL COUNTRY HOUSE.—Herr KARL ZABOKRTSKY.

sumably, as the adviser of this authority, he is primarily the person to decide what is to be the town of the future—the prophet who is to project his mind into the coming years, and say: Here shall be the town hall, here the cathedral, here the markets, the banks, the public buildings; there the factories, the pleasant workmen's cottages, the neat villas embowered in verdure. At the end of that long vista of noble trees forming a boulevard 100 feet wide (which is at present a cabbage field) shall be the central park with its ornamental waters, its grottoes, glades and statuary—perchance a statue of the surveyor himself with a scroll representing the town planning scheme in his hand.

Seriously, town planning on paper is comparatively easy work. Readers of Dickens may remember it was carried on with great success by Mr. Scadder, who sold building plots surrounded by imaginary public buildings, in the city of Eden, to Martin Chuzzlewit. There is a certain charm in starting with a "clean slate," and in new countries such things are possible. Even in continental countries, long used to the bureaucratic sway of a centralised system of government, the path of the innovator is a comparatively easy one; but in England, with its long traditions of personal rights and local self-government, the successful application of the clauses under discussion is beset with difficulties.

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Nevertheless, the success which has attended the efforts of Mr. Lever, Mr. George Cadbury, and the Letchworth Garden City, is sufficient to show that private individuals can surmount those difficulties; and what they can do with the limited powers at their disposal ought to be capable of achievement by municipal bodies armed with the powerful weapons the Act has placed in their hands and supported by the prestige of the Local Government Board.

(To be concluded.)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) illustrates the first prize design, by Mr. H. Van Buren Magonigle, for the Robert Fulton Memorial in Riverside Park, New York, which is a fine piece of scenic design for a river entrance to a park combined with a monument. The remaining illustrations this week are of students' work for the Society of Beaux-Arts Architects.

La Construction Moderne (Paris) has an article discussing the proposed connection of the Rue de Rennes with the Rue du Louvre, a problem in the town planning of Paris which presses for early solution, and compares the suggestions of Baron Haussmann and M. Hénard, the latter of whom advocates an X-planned bridge as part of this solution. An illustrated article on modern Italian wrought-iron work particularly refers to the work of MM. Calligaris. A small Parisian tenement house, of which M. Jullemier is the architect, is also illustrated.

Il Monitore Tecnico (Milan) in its series of articles on the buildings of the Turin Exhibition of next year now illustrates the design for the English pavilion, prepared by Messrs. Fenoglio, Molli & Salvadori.

Engineering Record (New York) describes and illustrates the new Chicago station of the Chicago and North-Western Railway. An interesting article by Professor Wallace C. Sabine, of Harvard University, on architectural acoustics deals with the effect of ventilation and heating on sound transmission. A useful series of diagrams for designing reinforced concrete beams is contributed by Mr. Frank H. Carter, designing engineer to the Boston Elevated Railway Company.

Correspondence.

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Architecture in London.

SIR,—London, the metropolis of the great British Empire, has never recognised the noble art of architecture.

Before the Great Fire in 1666 the eminent architect Inigo Jones planned the Royal Palace at Westminster, which was never completed with the exception of one of the pavilions (the banqueting room at Whitehall). If this fine scheme had been carried out London would have possessed the grandest royal palace in the world.

However the usual "penny wise and pound foolish policy" wrecked this grand scheme. I believe the original plans are still in existence. After London was destroyed by the Great Fire Christopher Wren, the architect of St. Paul's Cathedral, made plans for the rebuilding of London from the Cathedral to the village of Charing. This magnificent scheme shared the same fate as the Royal Palace at Westminster. In the early seventies of last century, when the building of Government offices was contemplated, Frederick Sang submitted his scheme of "the Westminster improvements and concentration of Government offices." His plan was to form a grand avenue, broken by squares, of all the Government offices from Trafalgar Square to the Houses of Parliament; a new National Gallery in Trafalgar Square and the Government offices in the style of Inigo Jones's Palace of Westminster, the present banqueting room in Whitehall forming one of the pavilions of the first square from the National Gallery. The usual policy wrecked this grand scheme. Since that time different blocks of Government offices have been erected here and there in the neighbourhood of the Houses of Parliament at a far greater cost than Frederick Sang's original scheme, which bears out what I said above about "the penny wise and pound foolish policy" of treating architecture in London. On the Continent, especially in France, £ *s. d.* is never considered in the art of architecture, which accounts for the success of grand architectural schemes, and after all when we come to consider, this is the best and most economical policy in the long run. There are scattered over London numerous buildings, such as public and private buildings in the City and West End, both old and new, which are grand examples of architecture, but no comprehensive scheme has ever been carried out in this vast city. However, the improvements and sanitary arrangements can compare most favourably with the great cities on the Continent. The parks and open spaces of this the greatest city of the world account for its healthy state, and we need not fear the reappearance of epidemics such as plague, cholera, &c. What we require in London is a high school or royal academy of architecture on similar lines to l'Ecole Nationale et Speciale des Beaux-Arts, Paris, and recognition of the noble art of architecture.—Yours obediently,

RECTE AUT NIL.

GENERAL.

MR. SYDNEY PERKS, F.S.A., the City Surveyor, has been voted the silver medal of the Society of Arts for the paper he read recently on the Guildhall. The medal will be presented in November.

MR. THOMAS HENRY HEALEY, of Bradford, and of St. Annes-on-the-Sea, Lancs., architect, of the firm of Messrs. T. H. & F. Healey, of Bradford and Halifax, left estate valued at 11,780*l.*

THE work of repairing the south transept of Hexham Abbey is nearing completion. The pinnacles are being rebuilt. Messrs. Holloway Bros., London, are carrying out the work of reparation under the supervision of Mr. Temple Moore, architect. An appeal was made last October for 3,200*l.* for this work, and 3,057*l.* 8*s.* 4*d.* has been raised.

THE Governors of the Glasgow School of Art, authorised by the Scottish Education Department, have granted seventeen travelling bursaries of the aggregate value of 385*l.* The winners of the bursaries for the architecture section were: Alexander T. Scott, 30*l.*; Richard M. M. Gunn, 20*l.*; William B. Binnie, 20*l.* The judges were Mr. John M. Monro, F.R.I.B.A.; Mr. W. Forrest Salmon, F.R.I.B.A.; Mr. T. L. Watson, F.R.I.B.A.; with Professors Bourdon, Gourlay, and M'Gibbon.

IT is proposed to erect in Drayton Church, Berks, a carved oak chancel screen in memory of the late Vicar, the Rev. F. E. Robinson, Master of the Oxford Diocesan Guild of Church Bellringers, who was known as a skilled and enthusiastic change-ringer. Mr. Robinson had himself carved an aisle screen, organ-case, choir stalls, and oak bench ends for his church, and had obtained an architect's design and a faculty for the chancel screen, which is now suggested as a suitable memorial, the estimated cost being 320*l.*

THE L.C.C. Education Committee have informed the London County Council that, in connection with the question of the need for the provision of additional elementary school accommodation, it is necessary that plans should be made showing the present accommodation at a large number of schools. The committee state that the possession of such plans, which they consider essential, would be of great value and would often obviate the necessity for visits to the schools. It is estimated that the work will necessitate the employment for two years of additional draughtsmen in the architect's department, and the cost involved will be about 1,000*l.* The expenditure during the current financial year will amount to about 350*l.*

THE Local Government Records and Museums Committee of the London County Council report as follows:—We have for some time held the opinion that the preparation of a return of outdoor memorials in London would form a valuable addition to literature concerning London, and would meet a great want. Nothing of the kind is at the present time published, and communications are from time to time received asking whether it is possible to purchase a book or pamphlet containing particulars of London memorials. We have accordingly had prepared a return of outdoor statues and other memorials in London specifying, in the case of statues (1) name of sculptor, (2) date of erection, (3) material and description, (4) custodian, and (5) such additional particulars as it appears desirable to record, and in the case of other monuments (1) date of erection, (2) material, and (3) custodian. Illustrations of twenty-four of the more important memorials will be inserted in the volume which has been prepared to harmonise with the Council's publication, *Indication of Houses of Historical Interest*. The volume will shortly be ready for issue, and will be placed on sale at 1*s.* 6*d.*, and a copy will be sent to each member of the Council who expresses his desire to have one.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, July 16.

Architectural Association, Camera Sketch and Debates Club : Excursion to Dieppe, Beauvais, Amiens, &c. Closes July 31.

Royal Sanitary Institute : Provincial Sessional Meeting in Cambridge.

Monday, July 18.

Royal Institute of Public Health : Congress opens at Birkenhead.

Tuesday, July 19.

Royal Archæological Institute : Annual Meeting at Oxford. Closes July 28.

Thursday, July 21.

Egypt Exploration Fund : Lecture at King's College, Strand, on "The Season's Work at Abydos," by Mr. T. E. Peet.

Friday, July 22.

Cambridge Local Lectures : Summer Meeting opens at York. First part July 22 to August 4.

Royal Sanitary Institute : Provincial Sessional Meeting at Torquay.

"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

THE work sent in for June shows an agreeable increase in quantity, whilst the standard of quality is remarkably high, and the competition for the first place is exceedingly keen. As a general rule, however, there has not been quite so much care given to the question of construction as we should have wished to see and as the subject for the month, an example of woodwork, demands.

"Sans Peur" sends three sheets of drawings of choir stalls and bench ends from St. Paul's Church, Jarrow-on-Tyne, an interesting example of quaintly designed and wrought wood work and carving with a considerable amount of Flemish feeling in the patterns of the Flamboyant tracery. The author's work is noticeable for the full-size details included, although the craftsmanship of the carving would have been better expressed by a further suggestion of shading.

"Loidis" has a collection of examples of "Ecclesiastical woodwork in Yorkshire—fifteenth century." All of this is not, however, strictly fifteenth century, and much is late. Thus the choir stalls in Wensley Church, Yorkshire, originally in St. Agatha's Abbey, Easby, bear the date 1527, and the character of the detail corroborates the date. Wensley Church furnishes other subjects measured and drawn by "Loidis"—a parclose screen to the Scrope chantry at St. Agatha's, Easby, removed to Wensley Church in 1536, and a so-called reliquary now used as a poor-box. If this really was a reliquary it is a rare example, as reliquaries in mediæval times were usually of metal or ivory, silver or copper gilt, or even gold, and enriched with enamels and gems. Other examples included by "Loidis" are a lectern from Grinton Church, Yorkshire; a lectern in All Saints Church, Pavement, York, originally in St. Crux Church; and an old oak choir stall from All Saints Church, North Street, York. Thus "Loidis" contributes an interesting series of specimens, but as testimonies of study insufficient space has been given to each to render them instances of thoroughness.

Mr. REGINALD PYWELL has taken for his subject this month the oak Watching Loft at St. Albans Abbey, and has fully and carefully measured and drawn this fine piece of work in two full sheets to half an inch and inch and a half scale, with details one-quarter full size. Mr. PYWELL's drawing suffers, however, from the inferiority of his rendering of carving, and he should in all serious study avoid the meretricious sparkle obtained in a drawing by the use of back lining.

Mr. SIDNEY CLARK contributes a well-drawn sheet showing the oak screen to the entrance of St. Catherine's Chapel in the south transept of Carlisle Cathedral, the date of which is given as about 1490. Mr. CLARK quotes Mr. FRANCIS BOND as describing the tracery in this screen as "French Flamboyant." It is certainly Flamboyant, but we consider the feeling to be Flemish rather than French as delineated by Mr. CLARK. This sheet of drawings deals more properly and fully with the construction of the woodwork than many others submitted, for which the author deserves commendation.

"Balgownie" has selected an interesting subject in the details of the stalls and screens of King's College Chapel, Aberdeen University, which he has illustrated very fully in four sheets of drawings. His draughtsmanship, however, seems to have suffered from haste and is not sufficiently careful and accurate. A great variety of design is seen in the panelling, which is of very late date, 1500 A.D., Flamboyant in character and Flemish in feeling.

"Ionic" has measured and drawn on a single sheet a choir stall and miserere from St. Mary's Cathedral, Limerick, chiefly remarkable for the quaint carving of a winged gryphon. The drawing is fairly well executed, but needs further shading to express adequately the design of the carving.

"Esek" sends two sheets of drawings representing a parclose screen to a chantry chapel in St. Oswald's Church, Methley, Yorkshire, the date of which is given as about 1420. The screen is thoroughly English in feeling, a refined and good design with a wealth of pleasant invention and originality. "Esek's" drawing seems to have suffered from hurried work due to lack of time. A satisfactory number of full-size mouldings are given, but there is a paucity of details of carving.

We have awarded the prize for June to "Sans Peur" with some little difficulty in determining the superiority of his work to that of Mr. PYWELL, Mr. CLARK, and "Loidis."

"The Architect" Students' Sketching and Measuring Club has now completed its first six months of work, and we are very gratified with the response that has been made to its inception. There have been in all thirty-two individual members, and of these three—Mr. PYWELL, "Esek," and "Sans Peur" have contributed each month. As the work of these gentlemen has been of high quality and no one else has sent in drawings on more than three occasions, the award of the travelling studentship is therefore limited to the three constant and persevering members, for quantity as well as quality necessarily counts in the estimation of an aggregate.

The travelling studentship has been won by "Esek" (Mr. C. H. WALSH), after a keen and well sustained competition, and the closeness of the issue is shown by the small difference in marks between the winner and the runners-up. "Esek" scores 571 marks, Mr. PYWELL 568, and "Sans Peur" 519.

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We look forward to a continuance of the interest in the work of the club, the value of which is shown by the improvement that we observe in the work of the members, which is especially marked in that of " Sans Peur."

EXPLORATION IN EGYPT.

SOME of the results of the past season's work by the British School of Archæology in Egypt and the Egypt Exploration Fund are now on view, that of the former at University College, Gower Street, London, and that of the latter at King's College, Strand, London.

The British School of Archæology in Egypt, represented by Professor FLINDERS PETRIE and students of the School, has had for its field of operations the site of the great temple of Ptah at Memphis and, at Meydum, the earliest pyramid site, and the cemetery containing the earliest sculptured tombs of Egypt.

As illustrative of the ancient art of Egypt perhaps the most interesting objects at University College are the slabs from the Chapel of ATET, one of the two tomb-chapels in the mastaba of NEFERMAAT, tombs of the age of SNEFERU, the last king of the third dynasty, 4650 B.C. The slabs are remarkable for their mode of execution, which is entirely unknown elsewhere, the figures and signs being all cut deeply into the stone and then inlaid with coloured pastes. As far as is known this was one of the early experiments of the sculpturing of the tombs, which was never repeated.

One of these slabs shows a group of boatmen at the top, below which are two men kneeling and dragging a clap-net to catch birds, clearly wild duck or geese. These show the best example of the method, in which the figures are all raised convex from the surface, with detail of other colour inlaid across the figures. At the bottom is a delightful group of a little boy in charge of two green monkeys; one of them is grasping him by the wrist and the other is pulling the tail of a crane.

Another group shows men walking and carrying wine, figs and birds, also an ox and an ibex, the " cattle of the eternal house," and yet another group shows part of the figures of the family of NEFERMAAT, figures of kine, a man sacrificing a goat, whose head he has cut off, and whose blood is spurting vigorously. ATET is shown seated with her sons bringing birds to her as offerings, whilst one of the sons is snaring birds, with a clump of papyrus behind him, on which are perched two birds.

From the method of execution adopted the artists were limited to a silhouette rendering, but the amount of expression that has been attained is a wonderful illustration of the power of line and of skilful draughtsmanship.

The mastaba of RAHOTEP and NEFERT at Meydum has furnished some examples of the oldest tomb sculptures known, except a few pieces of uncertain source. The figures are those of RAHOTEP, the sons ZEDDA and NEFERKAU, and the daughters MERERT and NEZEM-AB. We see here the earliest completed style of the great art of Egypt which formed the basis of all later Egyptian art, but was never excelled in its accuracy and good taste.

Historically the most valuable object exhibited by the British School of Archæology in Egypt is a fragment of what is known as the Palermo stone, from the fact that a large piece of this treasure is at Palermo. This record contains a list of the pre-historic kings of Upper and Lower Egypt and a list of every year of the early history from the first dynasty, stating the principal event of the year and the height of the Nile.

From Memphis a number of seals and parcel labels illustrate the intercourse that was going on between Mesopotamia and Egypt in the fifth century B.C. Architecturally the most interesting objects are bronze fittings from doors and shutters, chiefly cornerpieces with hinge pins. The largest of these still contains the remains of the cedar door to which it was attached, and bears an inscription to the honour of PSAMTEK II., which is, however, a palimpsest to an older and partly erased inscription of the names and titles of an earlier king. Some finely coloured fragments of pottery of Roman date, probably between 0 and 50 A.D., were obtained from the site of the kilns at the south end of Memphis. In these Persian and late Celtic influence are more noticeable than Greek.

The principal work of the Egypt Exploration Fund during the past season has been done at Abydos, where operations were carried out at Umm el Ga'ab, the site of the Royal tombs of the first and second dynasties and in the north and south cemeteries. In the latter the earliest graves found were those of the pre-historic period. From these were obtained beads of carnelian, glaze, lapis-lazuli, limonite, calcite and diorite, pins and spoons of ivory, painted and decorated vases and flint spear and arrow heads and knives, some of which are remarkable specimens of highly skilled workmanship in chipping and flaking, one being as much as eleven and a half inches long.

A somewhat gruesome but remarkable exhibit is a skeleton of the pre-dynastic period, reconstructed in the exact position in which it was found, an example of a well-known type of burial in which the body was simply placed in a shallow trench with the arms and legs bent up, and occasionally wrapped in a skin or reed-mat.

From the site of the Royal tombs of the kings of the first and second dynasties have been brought pottery vases of two distinct periods, the one belonging to the early dynasties (probably first to fourth), and the others date from the nineteenth dynasty, and contain offerings made after the time when the worship on the site of the Royal tombs was revived by SETI I. Some curious crude clay or mud figures of OSIRIS as a mummy were here found, of which the full significance is not yet clear, although they occurred not far from the tomb of King ZER (or KHENT), which is known to have been worshipped in later times as the tomb of OSIRIS.

Other spoils from the cemeteries at Abydos to be seen at King's College are of various dates from the sixth to the thirtieth dynasties, many of the graves being cut through earlier ones of pre-dynastic times. From these information is obtained as to the progress of civilisation, and particularly of the change of fashion in pottery, which affords often the most reliable data for the determination of the age of archæological discoveries.

One of the most valued treasures recovered last season is a bronze fish on a sledge, its head surmounted by the attributes of the goddess HAT-HOR. Very few such representations are known, and this remarkable object, which is in perfect preservation, has been selected by the Cairo Museum, but photographs are on view in the exhibition.

The Græco-Roman branch of the Egypt Exploration Fund worked for two months only this season, and excavations were carried on in the cemeteries between Behnasa and Sidmant-el-Gebel. Previous rifling and plundering, ancient and modern, lessened the fruits of the exploration, whilst damp had ruined many of the papyrus cartonnages, but some papyri were obtained in fair condition, as well as pottery and a few objects of interest of late Roman, Byzantine, and Early Arab date. On the whole the work of this branch of the Fund does not seem to have been favoured with much success during the past season.

NOTES AND COMMENTS.

WE regret to have to record the death of Mr. A. HESSELL TILTMAN, F.R.I.B.A., on the 7th inst., at the age of 56. Mr. TILTMAN had made for himself a reputation as an expert in the design of public baths, a position the first steps to which were obtained by repeated success in competitions in the borough of Islington, where he carried out several baths.

THE citizens of Cardiff are justly proud of their Cathays Park and the public buildings that have been, and will be, erected therein, and a suggestion is now made that one of the garden spaces, that at the rear of the City Hall and facing the University buildings, should be made a Valhalla of Welsh notables, with a memorial to KING EDWARD VII., for sixty years Prince of WALES.

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THE threatened destruction of Christ Church, York, has been averted for, at any rate, twelve months, the recent resolution of the City Council to purchase the site and pull down the building having been rescinded at the last meeting of the Council, when resolutions were read from the Society of Antiquaries, London, the York Archæological Society, National Trust for the Preservation of Places of Historical Interest, and from the Yorkshire Philosophical Society, regretting that the parish authorities proposed to hand the church over to the Corporation, protesting against the proposed action, and asking the Council to reconsider its decision.

A DEPUTATION was received from the Yorkshire Philosophical Society, headed by Dr. TEMPEST ANDERSON, who said they had been in communication with the Society of Antiquaries, which passed similar resolutions to those of other societies. They had also been in communication with the National Trust for the Preservation of Places of Historical Interest and Natural Beauty, and he thought it was very likely, if the Council wished to spend 500*l.* as proposed, the latter organisation would be willing to take the church over as a trust, and might be prepared to spend the money in keeping the church up. He recommended that they should send the 500*l.* to the Trust and have a beautiful place preserved. The church was restored in 1862. It was now dirty, but he could assure them it was perfectly sound structurally, and, in spite of the restoration, had a beautiful arcade, piscina, arches, and clock, and the latter might be of public utility. Personally, he looked at it every time he passed, and probably others did the same. Petergate was one of the most picturesque streets in York, and they could not afford to fritter away all their attractions in York, which would be simply suicidal. In time all would be gone, and visitors would not come to see them any more than a West Riding manufacturing town. The church, although not of the antiquarian interest of the Minster, formed part of the picturesque entrance into the Shambles, which was certainly one of the most picturesque streets in the country. The church at the other end of the Shambles had been pulled down, and if they pulled this one down it would be said they might as well pull the street down also. They should remember that other people thought a good deal of the antiquities of the city, and he had letters showing how they were valued.

DR. SOLLOWAY, secretary of the Yorkshire Architectural and York Archæological Society, supported Dr. ANDERSON and said that the church was one of the treasures of the city. People came to see the churches, the walls, St. Mary's Abbey, and more to see the churches than all the other things together, and if they began to take down the church a great deal of obloquy would rest on the city. If they started pulling down the church where was it going to stop? The other picturesque church had gone, and it had been proposed to pull down St. Michael's, Spurriergate; St. John's, Micklegate; All Saints, Pavement; St. Mary's, Bishophill Senior; St. Martin's, Micklegate; and St. Helen's and St. Anne's was now used as a warehouse. What the next proposition would be he did not know. He hoped they would have nothing to do with the pulling down of that church. It certainly went back to the time of the Normans and dated from 1252. He appealed to them to reconsider whether, if they purchased or not, they would pull down.

THE Rev. R. O. HUTCHINSON, Vicar of St. Sampson's, spoke in favour of the pulling down of the church on the ground that there were no funds for putting or keeping it in repair, and that if it were repaired there was no use for it. We are glad to find that the Council took the course of rescinding their resolution to pull down the building. There can be no question that, even for the reason put forward by Dr. ANDERSON, it is bad business for any community to lessen the attractions of their town for visitors by sweeping away antiquities.

A CORRESPONDENT of the *Manchester Guardian* voices what he thinks would be the opinion of calico printers and woven goods manufacturers on the proposed amendment of the law of copyright in this country, and says that it is hardly likely they will consent to exchange their present position of absolute ownership by purchase of design and copyright for one in which they are to be only limited owners, compelled to advertise the designer whenever they reproduce his design, for a period of perhaps sixty or seventy years. This is exactly the reason, in our opinion, why the law of copyright should be amended to protect the designer, who is the creator of that quality in the fabric that attracts the purchaser.

SHEFFIELD shows to what the mastery of the manufacturer over the artist leads. At the present time there are modellers who are out-workers in Sheffield getting from 25*s.* to 30*s.* a week—men capable of the highest class of artistic work—men who are real artists at their work, and who could produce anything you want. These men leave Sheffield, where they cannot get 2*l.* a week, and earn 700*l.* to 800*l.* a year in America, Canada, Scotland, and other parts of the United Kingdom.

A COMMUNICATION to the *Times* from Mr. F. J. COLE, of University College, Reading, calls attention to the discovery at St. Mary's Church, Cholsey, of the almost complete foundations of an apse external to the north transept, of which he says that the foundations are 3 feet to 4 feet below the present level, and consist of blocks of chalk arranged in a semi-circle and merely filled in with sand. The footing of the transept wall, however, is concreted. The foundations of the apse have been greatly disturbed on the north side by subsequent interments, but with care they have been able to complete the excavations successfully. This discovery must be held to demonstrate the twelfth century date of the transepts of this church—otherwise open to question. We therefore have in Cholsey Church a rare example of a Romanesque cruciform parish church, which, apart from the extension of the eastern limb in the thirteenth century, an extension which beyond criticism, is largely in its original condition.

WITH regard to the proposal to crown the Old Steeple at Dundee, Mr. J. OLDRID SCOTT has reported that he was very pleased to have an opportunity of seeing the Old Steeple again. It was a very noble tower, and one which, so far as he knew, stood quite alone in its design. His chief object in seeing the Steeple was to assure himself of its stability. The walls were of great thickness—eight feet in the lower division and five feet above. He was told that the tower was slightly out of the upright, but it was certainly not enough so to cause any weakness. The masonry was of the highest order, no settlement of the least importance being anywhere visible. He had no doubt at all that the tower was fully able to bear the weight of the proposed crown. He understood that the question of cost was a very important one, but there was no certain way of ascertaining this except by obtaining tenders from builders, and before doing this surveyor's quantities must be prepared. Whether new drawings would have to be made depended on whether those made by his father could be found. He hoped that permission might be given him to have steps taken for obtaining tenders from responsible builders. The expenses connected with this would not exceed 150*l.*, this being for architect's and surveyor's fees. The selection of builders to be asked to tender for the work was an important matter. None except really good masons should be asked, but whether their names should be obtained purely by selection or by advertising was a question on which the City Architect's opinion would be of much value. In any case, he should certainly advise the employment of a good clerk of works. In a work of this kind, so much exposed to the weather, it was essential that every stone used should be perfect in quality, and to ensure this constant watching would be necessary.

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MR. BANKS, who, it will be remembered, offered to defray the cost of putting the crown on the Old Steeple, is willing to pay for the cost of tenders, and the Works Committee of the Council have agreed to the tenders being obtained.

THE LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

ANNUAL EXHIBITION OF STUDENTS' WORK.

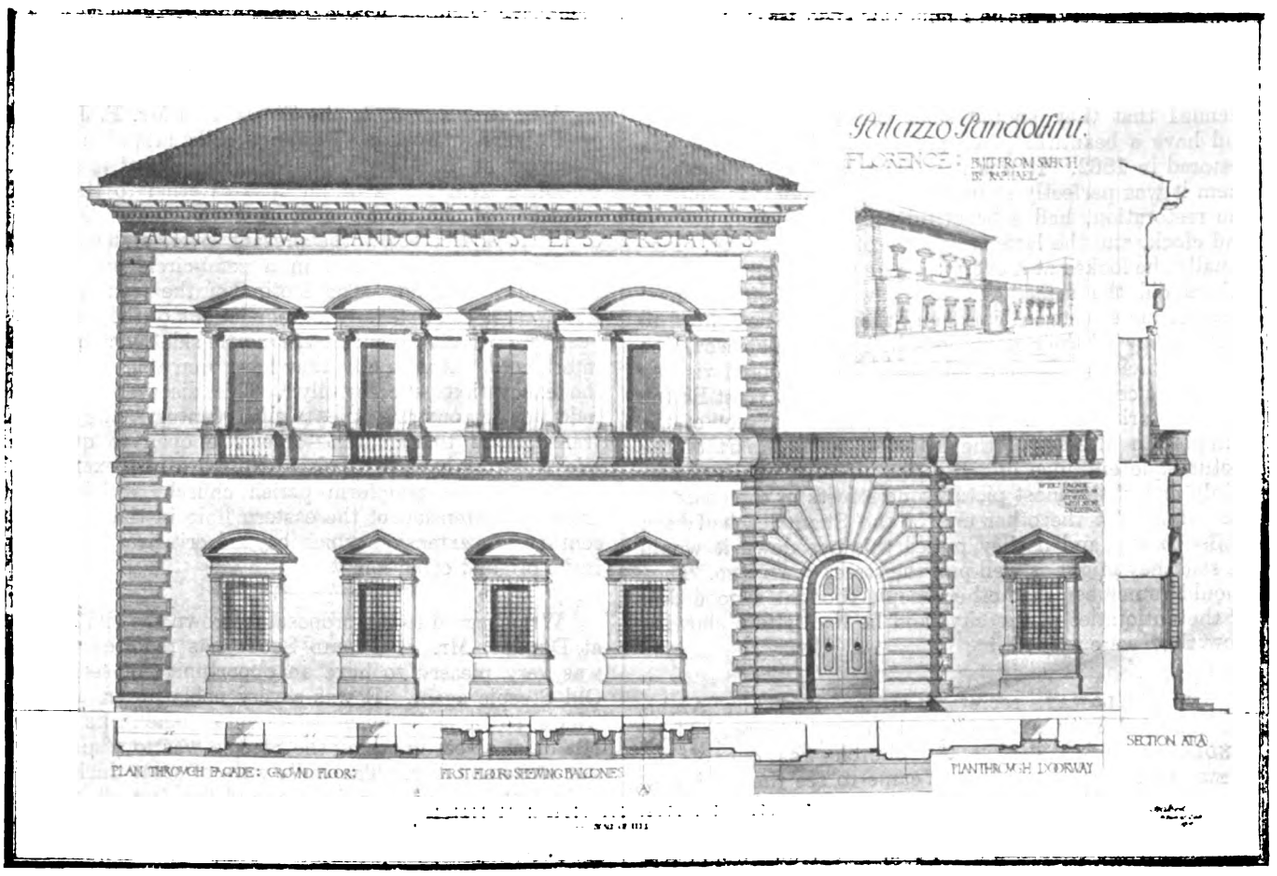
THIS year's exhibition is fortunate in being held under the most favourable conditions. Through the generosity of Mr. Lever, the old Liverpool Bluecoat School, in the centre of the city, was acquired last summer for the accommodation of the University School of Architecture, and it may be said to be quite ideally suited to the purpose.

The new quarters, renamed "Liberty Buildings" at Mr. Lever's suggestion, are typically eighteenth century in design, and cannot but have an insensible influence for good on the students daily in contact with them. The rooms throughout are pleasant in shape, and well disposed in their architectural relation to each other, and the arrangement of the building on three sides of an open forecourt lends itself to the convenient working of the different departments. Roughly the suite of the civic design staff, together with the accompanying lecture and demonstrating rooms, occupy the west wing, whilst the east contains the apartments of the school staff, the library, common room, and rooms for advanced students doing special work. The centre block facing the entrance gates, at the opposite end of the courtyard, is entirely occupied, on the first floor, by the great drawing hall and cast museum.

The exhibition itself is held in the main salon on the ground floor. This latter is sub-divided by detachable canvas screens extending from the side walls to the columns, which support the ceiling on either side. A double series of cubicles is thus formed, each lighted by a separate window, and each assigned to the work of one student.

A comprehensive survey of the drawings exhibited shows that competition is naturally keen for the various scholarships offered, the two most valuable of which are the Holt Travelling Scholarship (50*l.*), and one offered by Mr. Ronald P. Jones (also 50*l.*). To this last has been added a further grant of 25*l.* from the British School at Rome, and the conditions upon which the whole is awarded stipulate that the recipient shall reside for a definite period at the British School in Rome, where he shall devote himself to certain specified work.

Besides these and other annual scholarships, minor competitions are held from time to time during the course of the session. Perhaps one of the most interesting of this type was instituted by Mr. Lever some months ago. The problem presented was the laying out of a particular area in the model village of Port Sunlight. Prizes of 20*l.*, 10*l.*, and 5*l.* were offered for the designs placed respectively first, second, and third. In the event of Mr. Lever desiring to carry into effect on his estate any of the solutions submitted, an additional 100*l.* was to be paid to the author for the right of so doing. Mr. Ernest Prestwich, the winner of the first prize, has evolved an admirable treatment of the site, which is now in process of actual execution, and has therefore gained for him the sum of 120*l.* As Mr. Prestwich is also the successful candidate for the Ronald P. Jones and British School at Rome Scholarships he leaves the Liverpool School with a total of 195*l.* to his credit, and the degree of B.A., with first-class honours in architecture, an achievement upon which we feel we cannot but congratulate him.



MEASURED DRAWING BY H. A. DOD, TRAVELLING SCHOLAR, LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

An examination of the other schemes submitted in the case of the Port Sunlight competition shows a very high level to have been attained in the principles of domestic town planning. In practically every case, the main idea is well preserved, and the lesser features carefully subordinated to it. The actual appearance of each design, moreover, is well realised in a series of bird's-eye perspectives, the skill evinced in many of which affords ample illustration of the thoroughness of the instruction received in this branch of draughtsmanship.

From the mass of domestic work exhibited it would be difficult to select any individual example for special praise. It is uniformly excellent both in design and drawing. The construction sheets and diagrams of steel work, stone-vaulting, &c., are more highly finished and fully annotated than any similar drawings we recollect having seen outside America, and indicate a knowledge of practical buildings that is usually regarded as the province of specialists. Yet Professor Reilly assures us that these results are obtained in the comparatively short space of two to three years. The students at the school,

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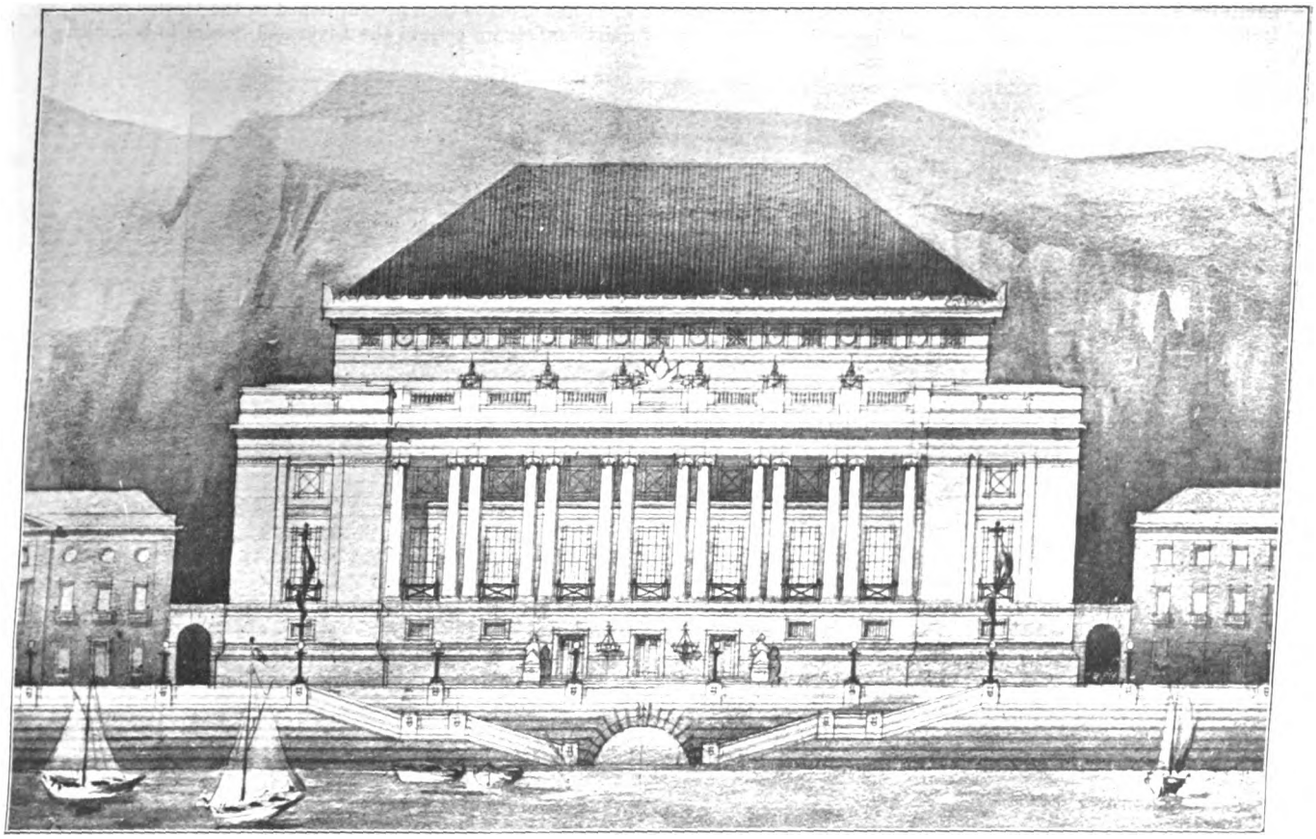
whether taking the Bachelor of Architecture or the certificate course, receive expert instruction from the start in the different branches of constructive work, and under competent direction are able to attain this degree of efficiency.

Attention to practical considerations, however, is not enforced at the expense of the more vital subject of design, the definite teaching of which must always be the main business of any school of architecture pretending to the exertion of a permanent influence on the development of style. Professor Reilly has always held that an intimate acquaintance with the achievements of the old masters cannot be better attained than by following the precedent of almost every great architect from Brunelleschi to Cockerell, and measuring the best work of the past. On this basis a real and living manner of expression can safely be built up.

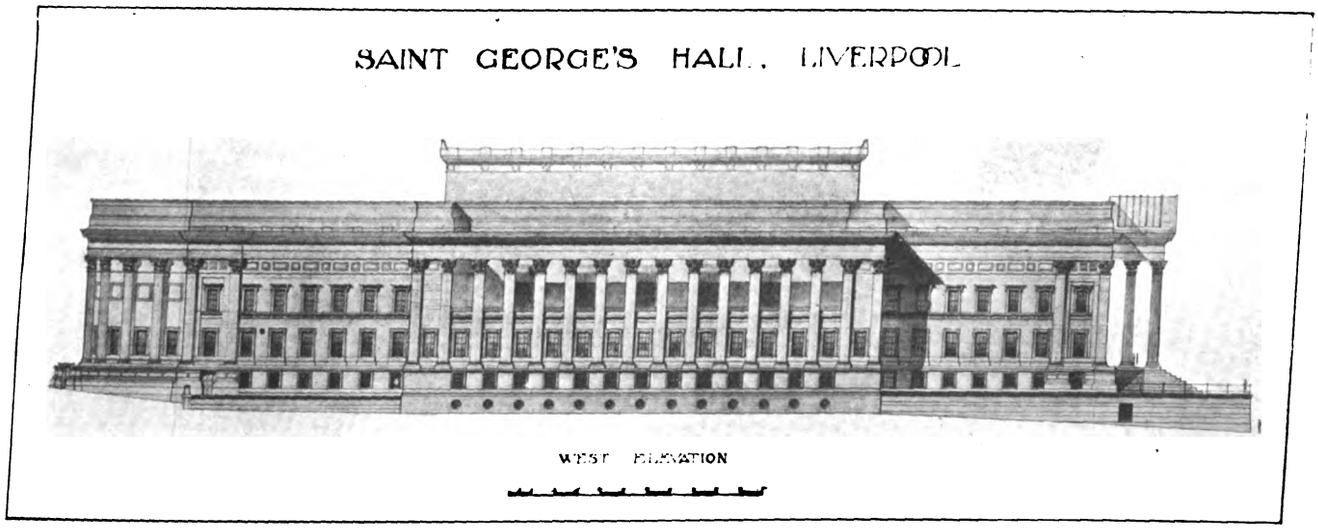
The students of the school therefore devote their vacations largely to making accurate and complete surveys of existing buildings, and the results of their studies are shown in a vast number of large and small scale rendered drawings. An idea of the scope of the school's activity in this direction may be gathered from an enumeration of some of the work so measured during the last session:—

Athens.—The Propyleia. Florence.—The Palazzo Pandolfini. Rome.—The Museo Barracco. Venice.—The Zecca and the Guard House. Genoa.—The Campo Santo. A number of wall monuments throughout Italy. Oxford.—The Ashmolean and Taylorian Institute. Cambridge.—Trinity Library. Bath.—Prior Park and the Palladian Bridge. Dublin.—The Custom House, Trinity College, the Casino Marino, and a great number of Georgian interiors. London.—The Church of St. Mary-le-Strand, and the Corn Exchange, Mark Lane. Liverpool.—St. George's Hall, the Athenæum, the House of Providence, the entrance to Prince's Park, the Museum and Library, St. Paul's Church, Seaforth Hall, the Wellington Rooms, the Town Hall, St. James's Chapel, and many eighteenth-century buildings. Manchester.—The Bank of England, &c.

In the actual execution of the drawings an American



DESIGN FOR A CASINO BY E. PRESTWICH. FINAL EXAMINATION, B.A. HONOURS, LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

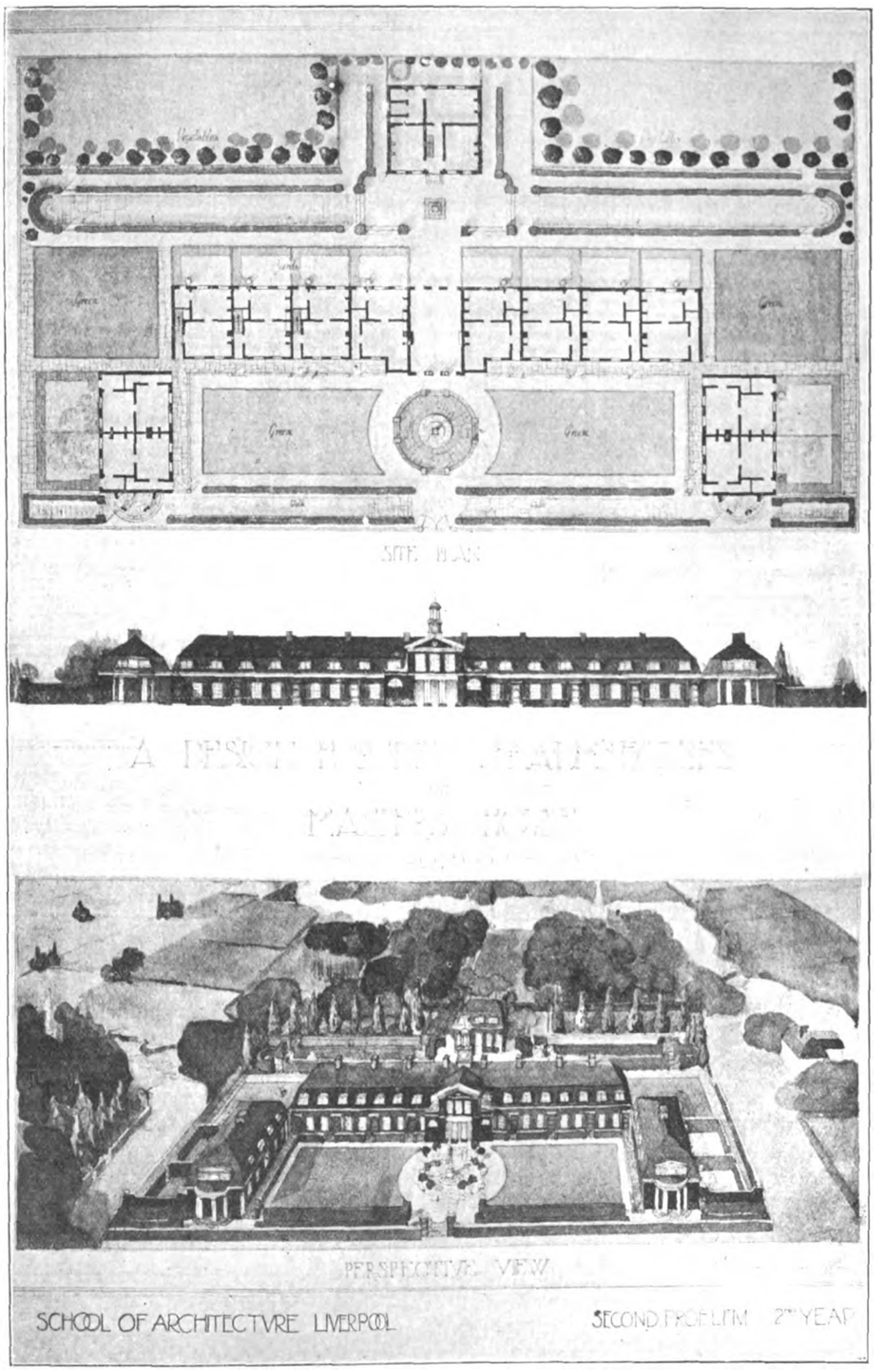


MEASURED DRAWING BY W. ALLEN, CERTIFICATE STUDENT, LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

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technique appears to prevail—except in one or two cases where purely Beaux-Arts methods are followed. Of the drawings illustrating designs by Cockerell several are particularly praiseworthy both in regard to the delicate and firm quality of the draughtsmanship and the skilful reticence with which the colouring is applied. Indeed the system under which the students are trained seems to ensure the abolition of slovenly and indifferent drawing altogether. This may no doubt be partially accounted for by the importance given to drawing from life and the antique, and to modelling—in which latter Reilly permits considerable freedom to his pupils in the choice of individual manner, and no restriction is imposed on the selection of material from essentially relevant sources of inspiration. At the same time neither antiquarian affectation nor the eccentricities of the fashionable Free Renaissance are tolerated—this much is evident from the type of work exhibited.

Speaking for ourselves and with the example before us of what has already been accomplished in the United States, we must confess we believe the Liverpool School to be making a



DESIGN BY P. C. HARRIS, CERTIFICATE STUDENT, LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

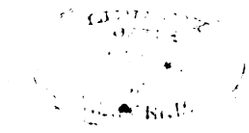
subject they receive the tuition of a professional sculptor, Mr. Allen, formerly a pupil of Mr. Hamo Thorneycroft.

The general character of the monumental designs produced by the school may be broadly defined as Modern Classic. In massing and composition the best American work serves to provide stimulating models, and in detail a logical and consistent development of the purest Néo-Grec motives is aimed at. The domestic work is for the most part simply an extension of Georgian and Late Renaissance principles. Professor

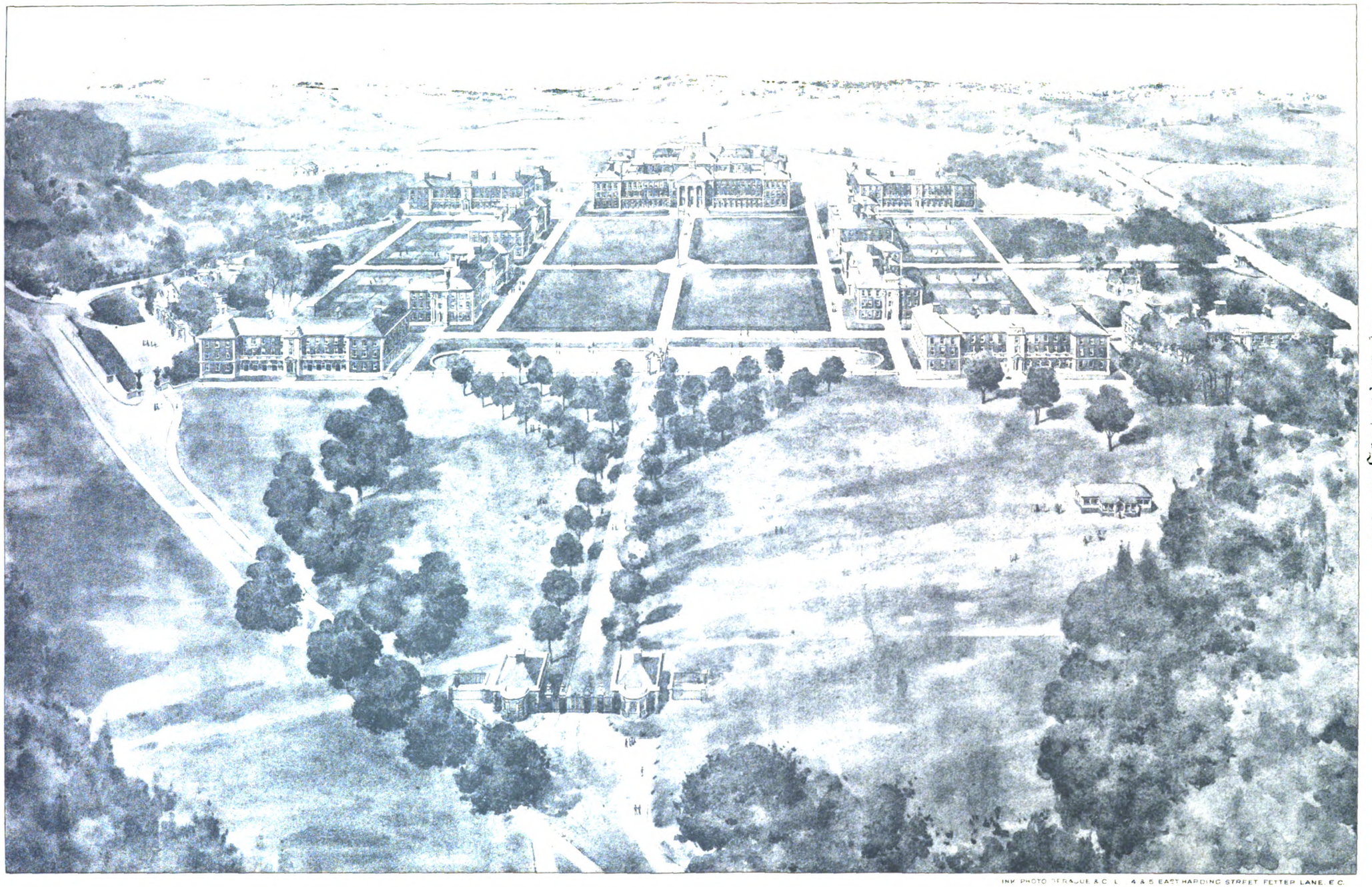
most serious contribution towards the formation of a vital national style. That this opinion is not without solid foundation may be gathered from the fact that, so much has the reputation of the school advanced within the last few years, only a fraction of the students are now of local origin. The majority come from neighbouring towns, such as Manchester and Leeds, from the south, from Scotland, Ireland, South America, the Colonies, and Europe.

We understand that the work of the exhibition is shortly

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COMPETITION DESIGN FOR CITY OF LEEDS TRAINING COLLEGE.

By Mr. T. BUTLER WILSON, F.R.I.B.A.

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COMPETITION DESIGN FOR CITY OF LEEDS TRAINING COLLEGE.
By Mr. T. BUTLER WILSON, F.R.I.B.A.

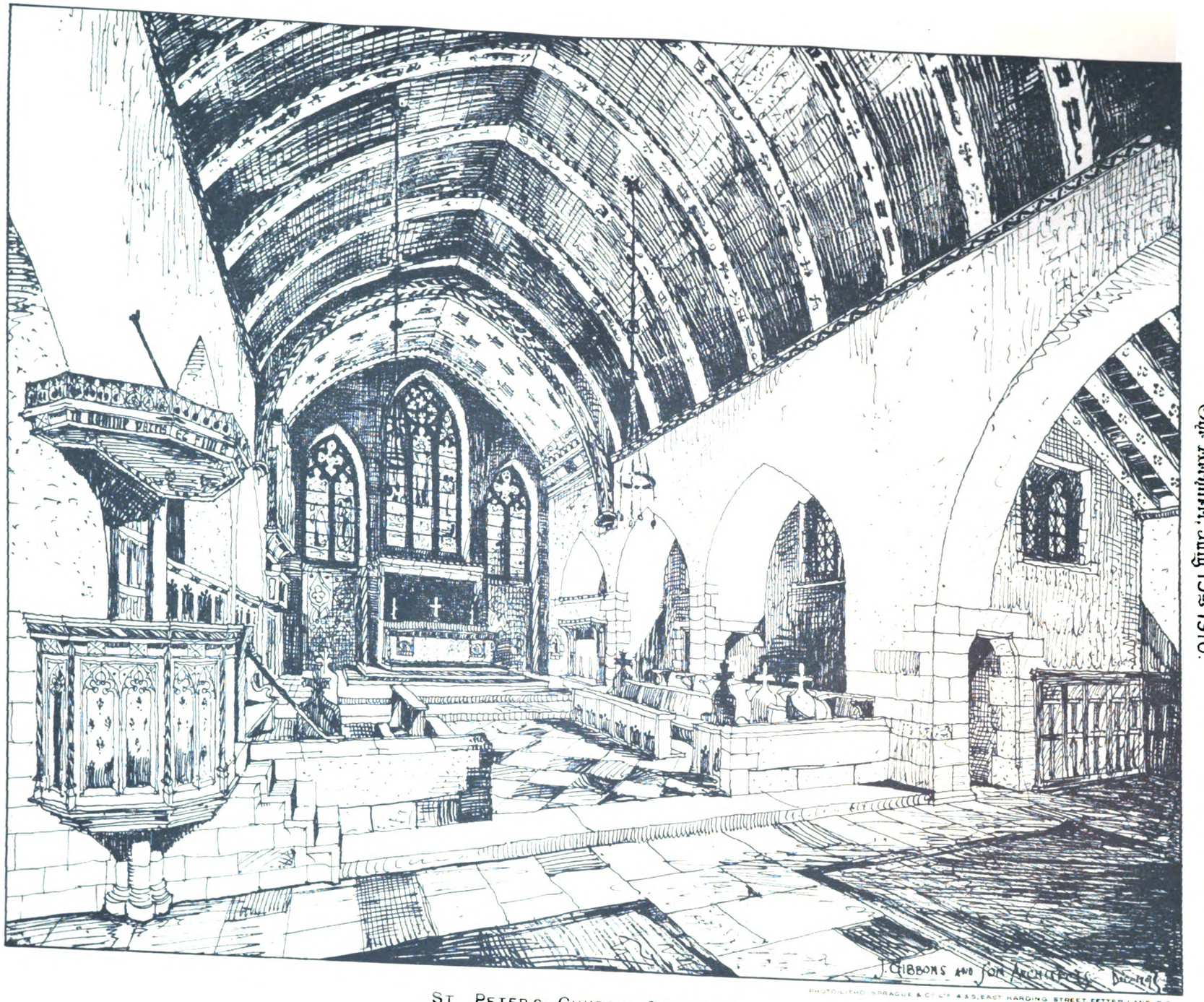
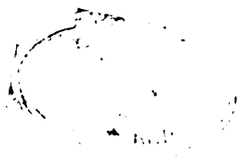


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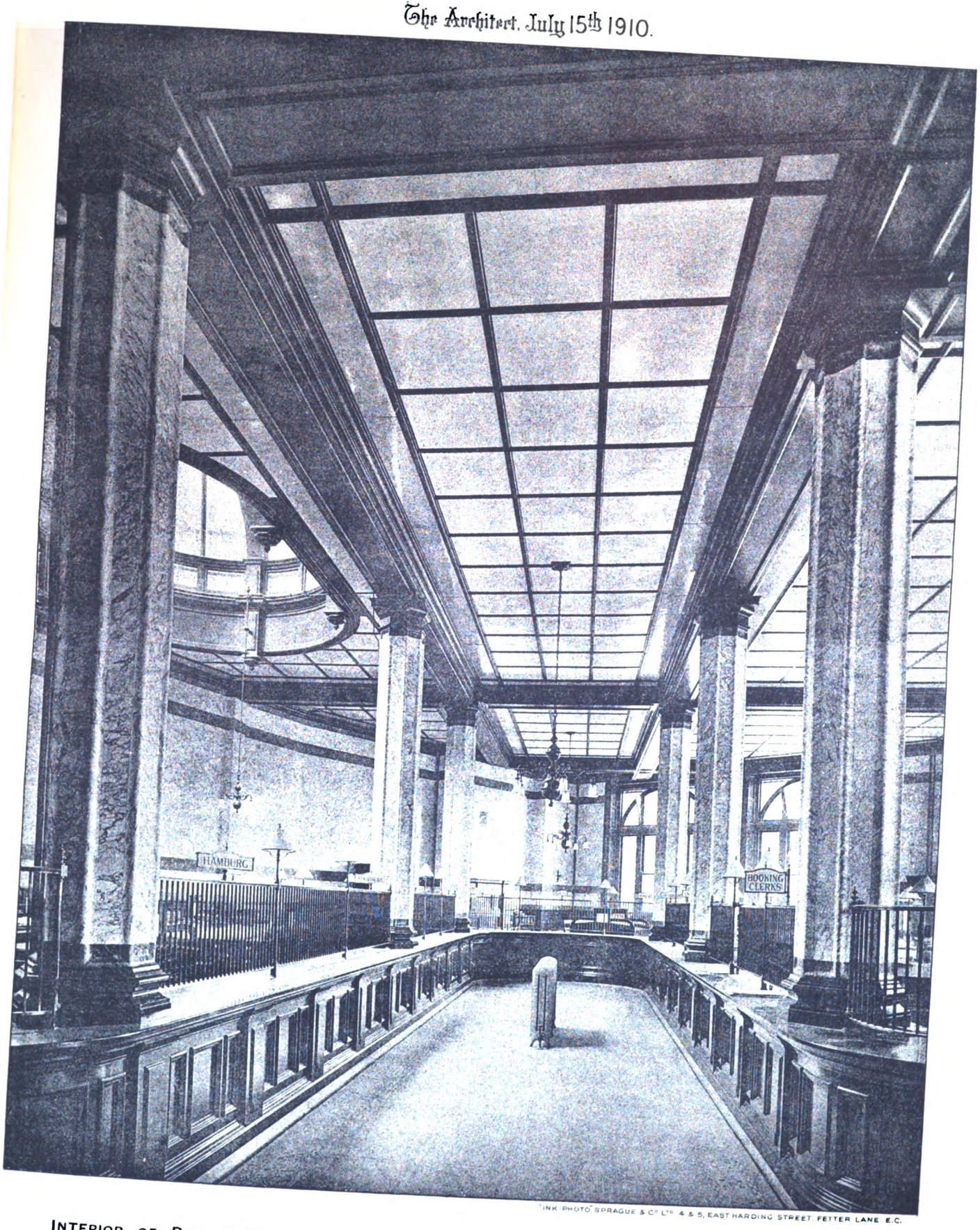
ST PETER'S CHURCH, STRETFORD

Messrs. J. GIBBONS & SON, Architects.

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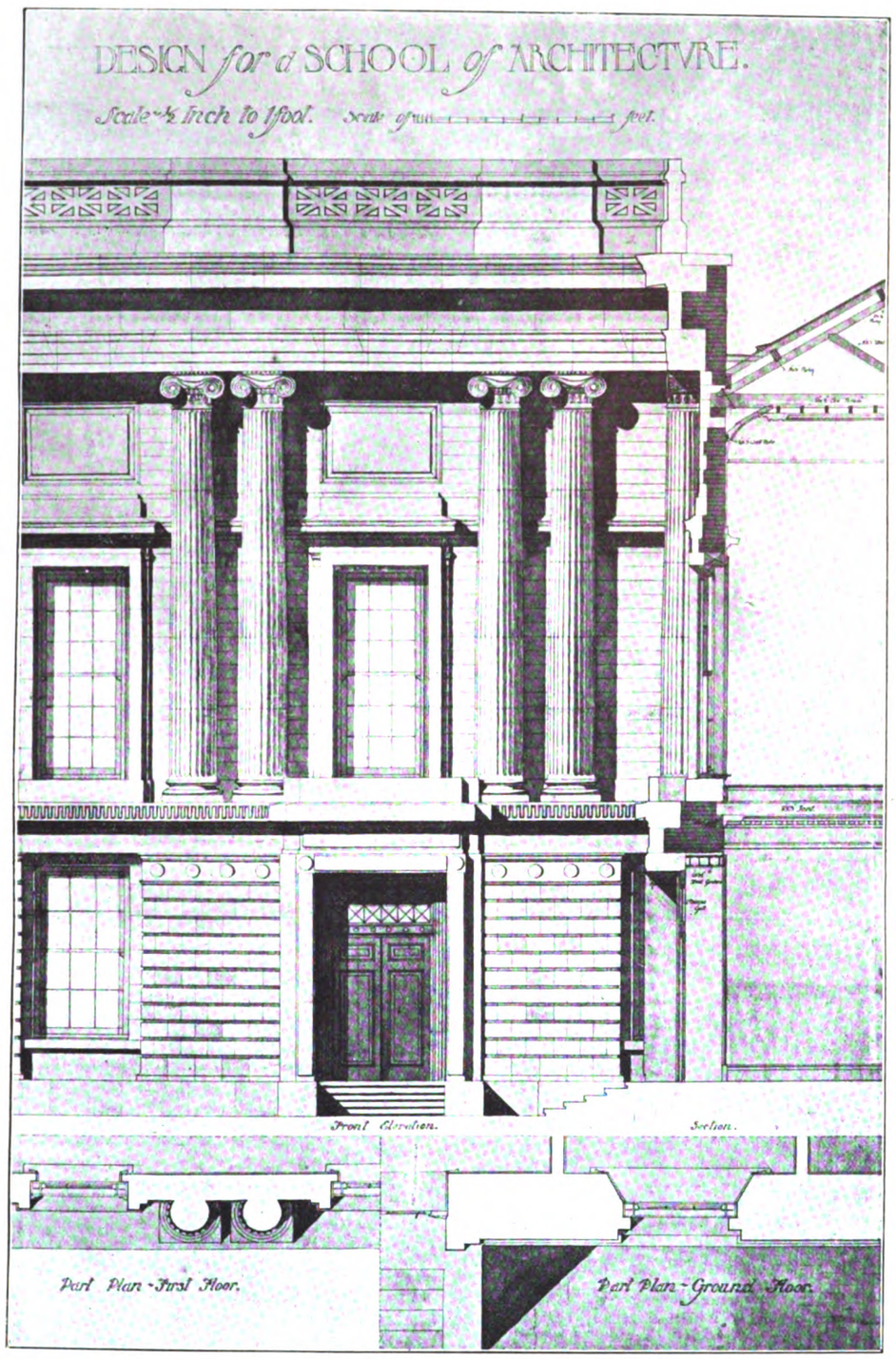
INTERIOR OF PUBLIC OFFICE, GENERAL STEAM NAVIGATION COMPANY, TRINITY SQUARE, E.C.

Mr. E. B. I'ANSON, F.R.I.B.A., Architect.

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DETAIL OF DESIGN BY C. A HARRINGTON, CERTIFICATE STUDENT, LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

to be published in book form at half-a-crown, and then our readers will have full opportunity of studying for themselves the results of the system at work in Liverpool.

ILLUSTRATIONS.

COMPETITION DESIGN FOR CITY OF LEEDS TRAINING COLLEGE.

THE various groups of buildings have been arranged so as to give a well-balanced and symmetrical plan. The Training College forms the north-west boundary of a large central quadrangle, more or less enclosed on three sides by the hostels for men and women, but entirely unobstructed to the south-east. The main axial line is at right angles to the natural contours of the site, which gives numerous advantages, including symmetrical elevational alignment and level roads on contours. The main walls would be of local brick faced with approved red-facing bricks and Horsforth stone dressings. The floors and flats to be of reinforced concrete, and the staircases of granolithic. The external roof coverings would be of Tilberthwaite green slates, or, in the case of flat roofs, of asphalte. Whilst undue elaboration and embellishment has been avoided, the author endeavoured to produce a design showing a considerable amount of freedom and eclecticism, yet expressing the nature of the buildings in a sufficiently scholarly, dignified, and economical manner. The cost, exclusive of furnishing, was estimated at 39,806*l*. This design was submitted in competition by Mr. BUTLER WILSON, F.R.I.B.A., Leeds.

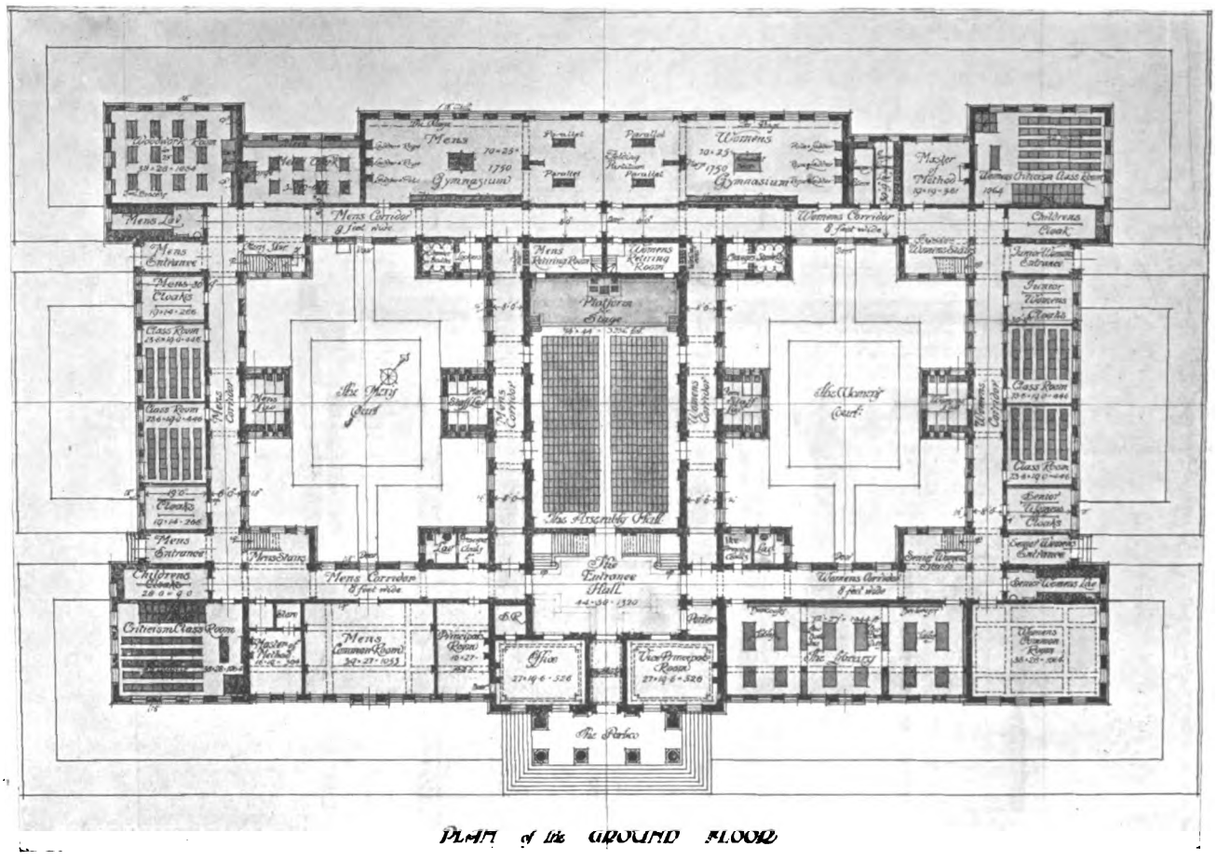
ST. PETER'S CHURCH, STRETFORD.

THIS drawing was submitted in a limited competition by Messrs. J. GIBBONS & SON, who have since carried out the work as architects.

INTERIOR OF PUBLIC OFFICE, GENERAL STEAM NAVIGATION COMPANY, TRINITY SQUARE, E.C.

THIS building is situated on the west side of Trinity Square, at the corner of Byward Street, and the whole of it is occupied by the General Steam Navigation

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PLAN of the GROUND FLOOR

COMPETITION DESIGN FOR CITY OF LEEDS TRAINING COLLEGE.—By Mr. T. BUTLER WILSON, F.R.I.B.A.

Company, Ltd. The frontage to Trinity Square is 38 feet and to Byward Street 79 feet. The plinth is of polished Peterhead granite, and above the plinth the fronts are of Portland stone. The roof is of concrete, and also all the floors, which are finished with terrazzo and pitch pine blocks, and all steel work is encased in concrete. The walls of the staircase are covered with egg-shell glazed tiles, decorated with tile panels illustrating the earliest and latest types of the steamships owned by the General Steam Navigation Co. The walls of the general office, which occupies the whole of the ground floor, are covered with Piastraccia marble with Siberian green marble bands, and the concrete casings of the stanchions are similarly treated. The ceiling is of enamelled iron in panels with teak ribs. The building is fitted throughout with electric light and warmed by hot water, and there is a complete system of telephonic intercommunication. Messrs. E. I'ANSON & SON were the architects, and Messrs. J. GREENWOOD, LTD., contractors.

KINGSWAY HOUSE, KINGSWAY, W.C.

OUR illustration shows one of the buildings that have been erected in Kingsway and are gradually developing the architecture of that thoroughfare. The work is, of course, in Portland stone, and beyond what our view shows there is little to be said beyond the fact that Mr. ARTHUR SYKES, F.R.I.B.A., is the architect.

HOUSE AT SEAFORD, SUSSEX.

THIS house has been recently erected at Seaford by Mr. J. FOX, builder, of Camberwell, from the designs of Mr. ERNEST RUNTZ, F.R.I.B.A. The house contains on the ground floor, besides the usual kitchen accommodation, three good sitting-rooms and a small hall, and on the first floor six bedrooms, bathroom, &c., the plan being very compact without being in any way cramped. The base walls are of red brick, and the upper walls coated with rough cast, the roof being covered with red sand-faced tiles. The detail throughout has been kept quite plain, but the proportion of the whole has been carefully studied. This house is one of four that are to be sold on completion by the builder.

COMPETITION DESIGN FOR WOOD GREEN BATHS.

THE design reproduced herein illustrates the scheme submitted by Mr. ARNOLD S. TAYLER, A.R.I.B.A., in the recent limited competition for the public baths at Wood Green. The general idea is that the entrances are governed by one pay-box. From the entrance hall access is arranged to the first-class and second-class slipper and spray baths. The dressing boxes are not contained in the hall of the bath itself, but in an adjoining room; this arrangement is considered to be more hygienic. Seating is arranged in amphitheatre form in the bath hall. On specified days women would use the swimming bath, which would only necessitate the closing of certain doors. The conditions of competition provide that steam will be delivered from the adjacent dust-destructor works, so that only a laundry and pump-room are provided, and no boilers. The levels of the site, together with the position and nearness of the existing drains to the surface and the desired retention of certain existing buildings, have also had a bearing on the working out of this scheme. The design, owing to simplicity in plan and elevation, while complying with all the conditions of the competition, is considered not to exceed 8,000*l.* or 8,800*l.*—the ultimate limit of expenditure. The assessor, however, adjudged that all the designs exceeded the cost of 8,000*l.*, and then selected designs, irrespective of the stipulated cost, which were in his opinion the best.

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KINGSWAY HOUSE, KINGSWAY, W.C.

MR. A. SYKES, F.R.I.B.A., Architect.

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HOUSE AT SEAFORD, SUSSEX.

Mr. ERNEST RUNTZ, F.R.I.B.A., Architect.

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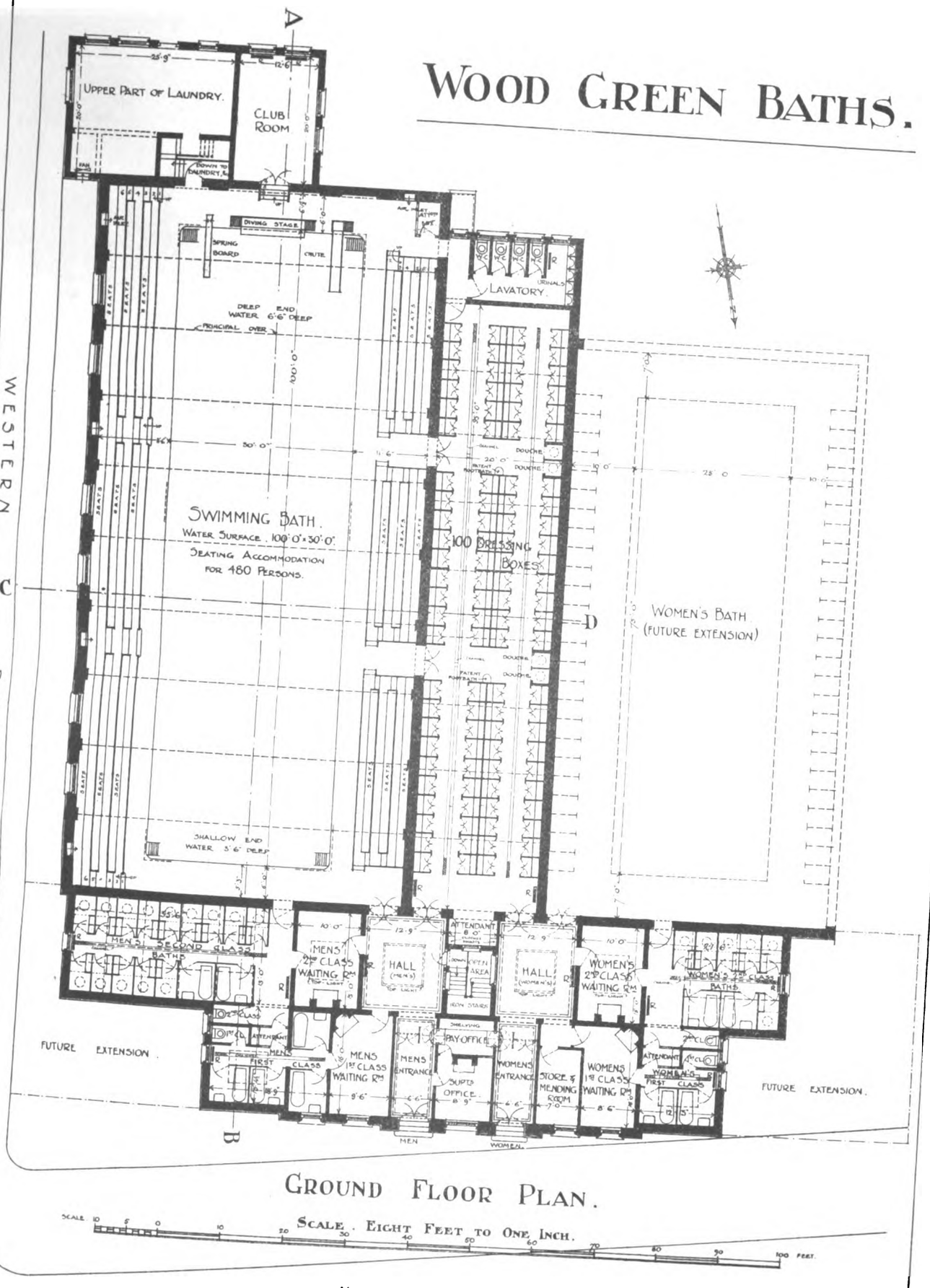


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COMPETITION DESIGN FOR WOOD GREEN BATHS.



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MODERN COLD STORAGE AND REFRIGERATION.

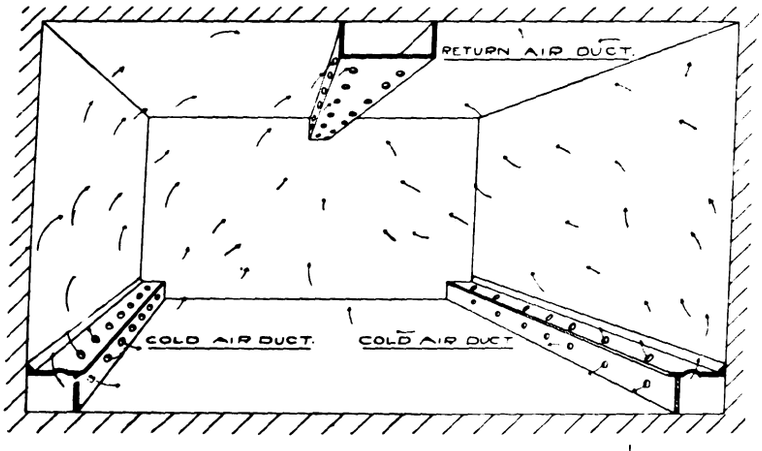
By W. S. DOUGLAS, B.Sc.

XIII.

IN the last article comparisons were drawn between separate air coolers and wall piping, and also between brine circulation and direct expansion. The only remaining method of cooling is still brine and direct expansion combined, the occasional necessity for which was explained at the end of Article X. Without pausing, therefore, to enlarge on this further, we proceed to devote some little attention to the actual circulation of the air in the chamber.

Air Circulation and Ventilation.

Since the appearance of Mr. Madison Cooper's articles in 1901 very little fresh knowledge has been gained and very little has been written on this somewhat important subject. Anything that can be said about it is accordingly more or less a *résumé* of the results of the experiments which he carried out, combined with an appreciation of the commercial difficulties in the way of giving effect to some of his recommendations.



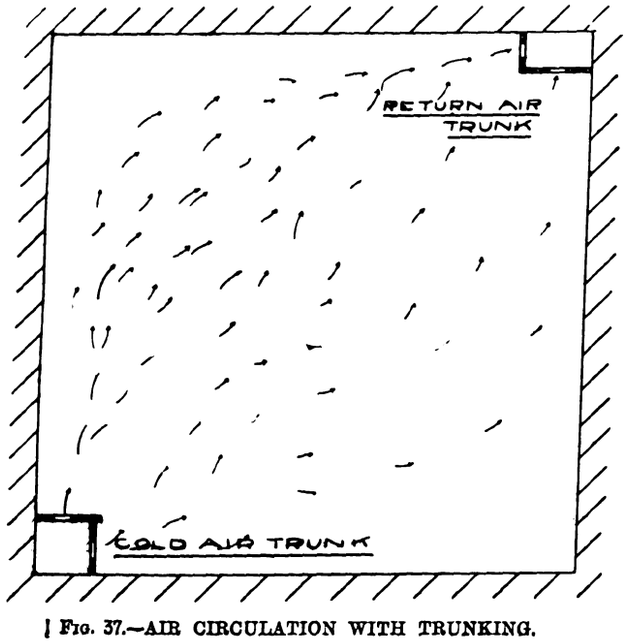


FIG. 37.—AIR CIRCULATION WITH TRUNKING.

The main essentials for a proper circulation are, firstly, that the air should be well and uniformly distributed; secondly, that nowhere should the force of the draught be such as to cause shrinkage in the goods; thirdly, that no floor space should be unnecessarily wasted; and fourthly, that the first cost should be as low as is consistent with efficiency. Various schemes which were tried with a view to combining these rather opposite qualities are illustrated in figs. 37 and 38, which are copies of Mr. Cooper's illustrations. The former gives two designs, both embodying trunks for flow and return of the air, one of which, having one delivery duct, can be used for narrow rooms, and the other, with two delivery passages, for wider chambers. In either a fairly uniform circulation is found to take place, especially if regulating slides are substituted for the holes shown, and neither can be said to waste an inordinate amount of floor space or to be unduly expensive as regards first cost. A further advantage is that the circulation follows the laws of gravity. This contrasts with the practice of some manufacturers, who insist on forcing the air to flow in the opposite way to that which it tends to follow. That is to say, instead of introducing the cold air at the bottom, whence it naturally rises as it becomes heated, they project it downwards from the top, their argument being that it is bound to fall. It certainly tends to fall, but before it has gone very far it grows warmer, and then it tends to rise. The consequence is that the circulation is proportionally retarded. In any case, if the air is wanted at the bottom of the room, why introduce it at the top?

Fig. 38 shows two of Mr. Cooper's own designs. In one, two very broad and narrow delivery ducts are led along the sides of the chamber near the bottom, the return being effected through a false perforated ceiling. In the other, which he claims to be the most efficient of any, both delivery and return are made through perforations in the floor and in the ceiling respectively. A very perfect circulation is obtained in this way, and although rather more floor space is taken up than with the schemes illustrated in fig. 37, there is compensation in the fact that with the perforated ceiling the goods can be piled almost to within an inch of the top. We have therefore always the same packing space available as with the other systems, and sometimes we have even more.

Unfortunately, we cannot always strive after theoretical perfection to the exclusion of other considerations, and it most inconveniently happens that the false floor and ceiling cost considerably more than the trunks. Accordingly in most cases the latter scheme is included in the makers' tenders, and indeed its efficiency, except in places where the goods are very closely packed, is so near to that of the first-named arrangement that the extra expense is scarcely warranted. Generally speaking, therefore, it is safe to recommend purchasers to have air trunking with suitable slides.

The next question which will arise in the minds of those used to designing buildings is that of ventilation. It is very important that no foul or tainted air should be allowed to approach the food which people are going to eat, but at the same time if fresh air were continuously to be sucked in from outside the efficiency of the plant would be seriously impaired. Fortunately, however, the advent of the cold blast has enabled us to purge the cold air itself of all impurities except that small residuum which is insoluble in water. Consequently with this system very little ventilation is required, and it is usually found that the amount of fresh air which is drawn in by the opening of doors is quite sufficient. Only in exceptional cases, as, for instance, in the storage of pears, is it necessary to provide facilities for a larger supply, and this, if required, can be conveniently obtained by opening slides in the suction ducts, communicating with the atmosphere. Fresh air is then drawn in to the desired amount, and at the same time foul air is expelled by corresponding slides in the delivery. Then, when the operation is complete, the slides are closed, and working continues under normal conditions.

Systems having no forced circulation are (or should be) employed only below freezing-point, and for the right class of goods, so that there will be very little vapour to remove. The opening of doors is then also considered sufficient to provide the necessary fresh air, but should an extra supply be desired suitable shafts must be provided. These rise from the corridors and have openings to each room through the various walls. A small fan may be fitted, or they may be connected to the chimney of the boiler, if such is available, in order to obtain the necessary suction, but in no case should they be carried simply to the outside of the building at the same level. Were this to be done, since cold air always tends to remain as low down as possible, there should be as much tendency for hot air to be sucked in from outside as for foul vapours to be removed.

The Application of Freezing Machines.

We have now studied various parts of refrigerating installations which are common to all of them, such as the compressor and the condenser, and other parts which are common to most, such as the insulation work and methods

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of cooling. It remains to consider each application individually and to illustrate modern practice in the various branches. Of the number and extent of these a rough idea has already been given, but perhaps the most important of any is the large cold store. We propose accordingly to make it first on the list.

Large Cold Stores.

By this term is inferred all large stores which have no special application. Generally these two conditions are synonymous, as special applications require only small stores; but in any case the construction of the larger plants differs in many respects from that of the smaller, and it has consequently been thought fit to include them in a separate class.

Large stores are most commonly used for meat, frozen or newly killed, fruit and vegetables, butter, eggs, and poultry, and are installed either by large wholesale provision houses or by companies floated to run them as public concerns, storing goods of any description, at any temperature in reason, for those round about. Sometimes, too, they are run by municipalities, who put the plants down partly to facilitate trade in their district, and partly in connection with their other undertakings, much in the same way as they would build an electrical power generating station. Definite storage rates are charged, which vary with the class of goods, and are higher if they must be stored at a low temperature.

Perhaps the best way to show how these stores are constructed will be to take one or two examples, which are actually in existence, and for the first of these we have selected the Galley Wall Road Refrigerating Works, as illustrated in figs. 39, 40, and 41, which were originally reproduced in "Ice and Cold Storage." This particular installation is very suitable for our purpose, as the building was constructed specially to contain it, and consequently the plant has been laid out by the consulting engineer, Mr. Birkett, on the most economical lines. It is also of a convenient average size, such as is frequently met with in everyday practice, and presents no abnormal features to divert one's attention from the main design.

The owners of the installation are dealers in so-called "offals," such as the head, feet, and various internal organs of cattle and sheep, which are much consumed by the poorer classes, and as the demand for these goods is irregular, being much greater in winter than in summer, the supply had in some way to be controlled. It was accordingly determined to erect the plant which we illustrate.

For the most part it is designed for long storage, the offals for this purpose being frozen, but it sometimes happens that there is an excess of supply over demand, which is merely temporary, and to meet this exigency ordinary storage rooms have also been provided. The total space occupied is about 100 feet by 50 feet, and the building has three storeys, the first two of which are taken up by the storing, freezing, and engine rooms, and the third by a large twin-chamber air-cooler. Externally no special attractions can be claimed for the structure, more especially as the walls are windowless, but some attempt has been made to relieve the general monotony by picking out the arches, which cover the recesses where the windows would ordinarily be, in blue Staffordshire bricks, and by using the same material round the doorways. Fletton bricks are used for the body of the walls and for the footings, and the roof, which is of timber construction, is covered with Bangor slates. The weight is carried principally on fifteen teak posts, each one foot square, and these have had to be supported on unusually elaborate beds. Each post rests in a cast-iron shoe, which is carried on stone templates and blue brick footings, and these in turn are supported by blocks of concrete 5 feet square. Very uncertain soil was encountered, and consequently the depth of these blocks had to be made at least 7 feet, in some cases considerably more, before a solid substratum was reached. Eventually, however, a firm grey ballast was discovered and has been found to answer very well, no subsequent sinking having yet been observed.

Coming to the interior of the building it will be noticed that the shape of the insulated space has been brought as nearly as is practicable to our theoretical cube, and also that a spacious apartment, separated by a brick wall from the cold stores, has been provided for the reception of the machinery. In both these cases ideal requirements are being complied with as far as possible. Another noteworthy feature is that steel girders have been used to carry the floor joists, and to prevent heat leakage through their highly conducting mass have been imbedded completely in the insulation. This is good from the point of view of first cost and the appearance of the job, as it does away with the wasteful projections sometimes made in the insulation in order to screen the joists, but it has in this instance the not too desirable effect of leaving, above and below the joists, very little thickness of insulating material. If they were boxed in, on the contrary, ample provision would have been made.

There are in all six cold rooms, five of which are on the ground floor. The largest of these, measuring about 50 feet by 50 feet by 8 feet high, is employed for storing the frozen offals, and of the four smaller apartments two serve for tem-

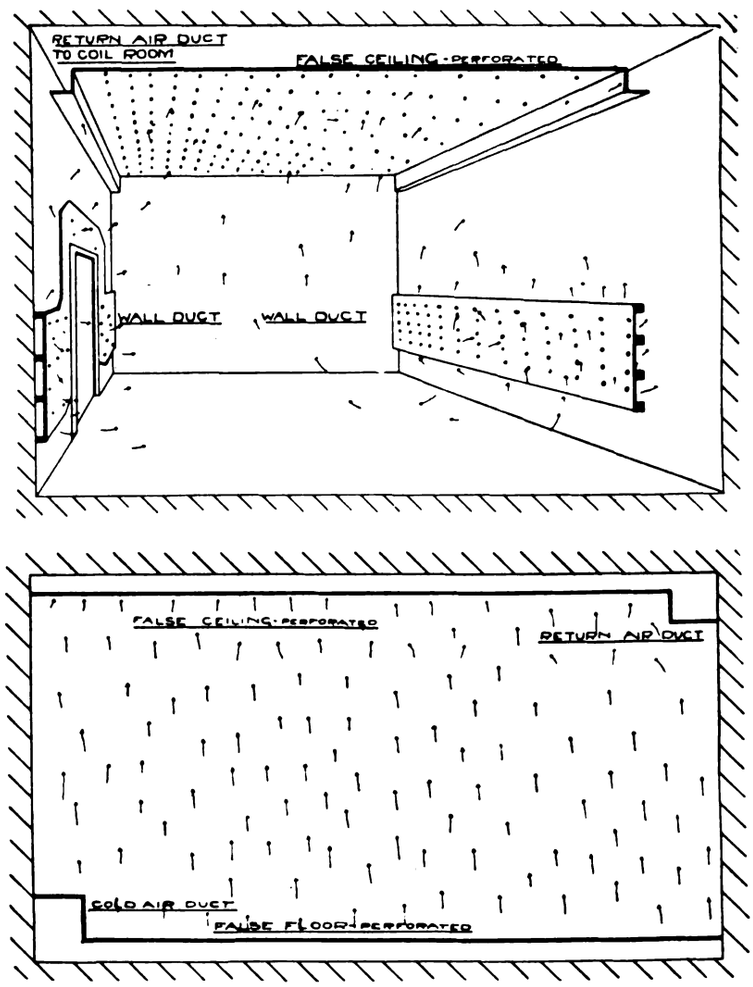


FIG. 38.—AIR CIRCULATION WITH FALSE CEILINGS.

porary storage above freezing point, and the remaining two are used to freeze the offals before they are put into the storage room. All five rooms are entered from a common corridor, which in turn opens at one end on to the street, thus securing an efficient air lock. There is also an extra entrance to the storage room, but in ordinary working this is kept locked, as otherwise there would be danger of careless attendants allowing the warm moisture-laden air to get inside.

Stairs lead from the corridor to the upper floors, and on the first of these is situated the second of the large storage rooms, which measures some 70 feet by 50 feet by 8 feet high, and is used, like the ground-floor room, for storing the offals after they have been frozen. Above, on the top floor of all, are the two wet air cooling chambers, which are furnished with stacks of tubing, connected direct to the suction of the compressors, and over which, as usual with this system, runs a continuous stream of trickling brine, elevated from a tank underneath the coils by a suitable pump. In the present instance the addition of the brine is an advantage, as practically all the space served by the coolers is used for storing the previously frozen offals and low temperatures are consequently

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necessary. Otherwise, had the rooms been designed for ordinary storage, it would have been more economical to have installed coolers on the dry system.

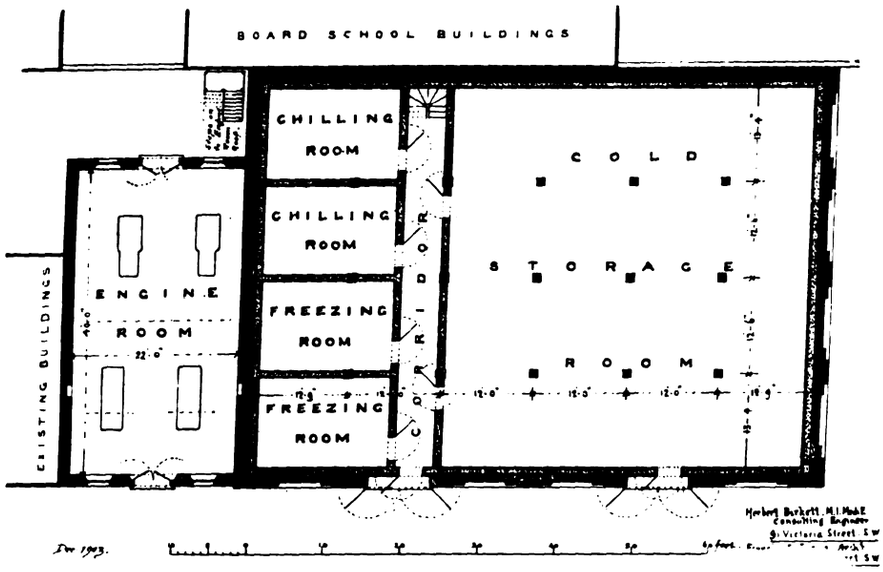


FIG. 39.—GALLEY WALL ROAD REFRIGERATING WORKS. GROUND PLAN.

Connection is established between the coolers and the various rooms by the usual arrangements of ducts, and in the chill and freezing rooms cooling is aided by pipes located in the rooms themselves. By this means the preliminary cooling can be effected more quickly, while in the storage rooms, where only the heat leakage has to be counteracted, air circulation alone is relied upon. This is maintained by two fans, one in each cooler.

The refrigerant used is ammonia, and there are two horizontal belt-driven compressors by the Mirrless Watson Company, Ltd., each of which is capable of manufacturing twelve tons of ice per day. They are driven through a countershaft by two Crossley gas engines of 45 horse-power each, and there are clutches so arranged that either compressor can be driven by either gas engine. In this case the evaporating coils, as we have seen, are placed in the air cooling chambers and act directly upon the air which has to be cooled. The only remaining unit of the system, therefore, is the condenser, and this is located directly above the engine room. It is of the atmospheric type, divided into sections to serve each compressor separately if required, and the tanks, which hold the coils and receive the water as it falls, are of cast iron. One of them will be noticed in fig. 40 in cross section. Together with its neighbour it is carried on an asphalte flat just above

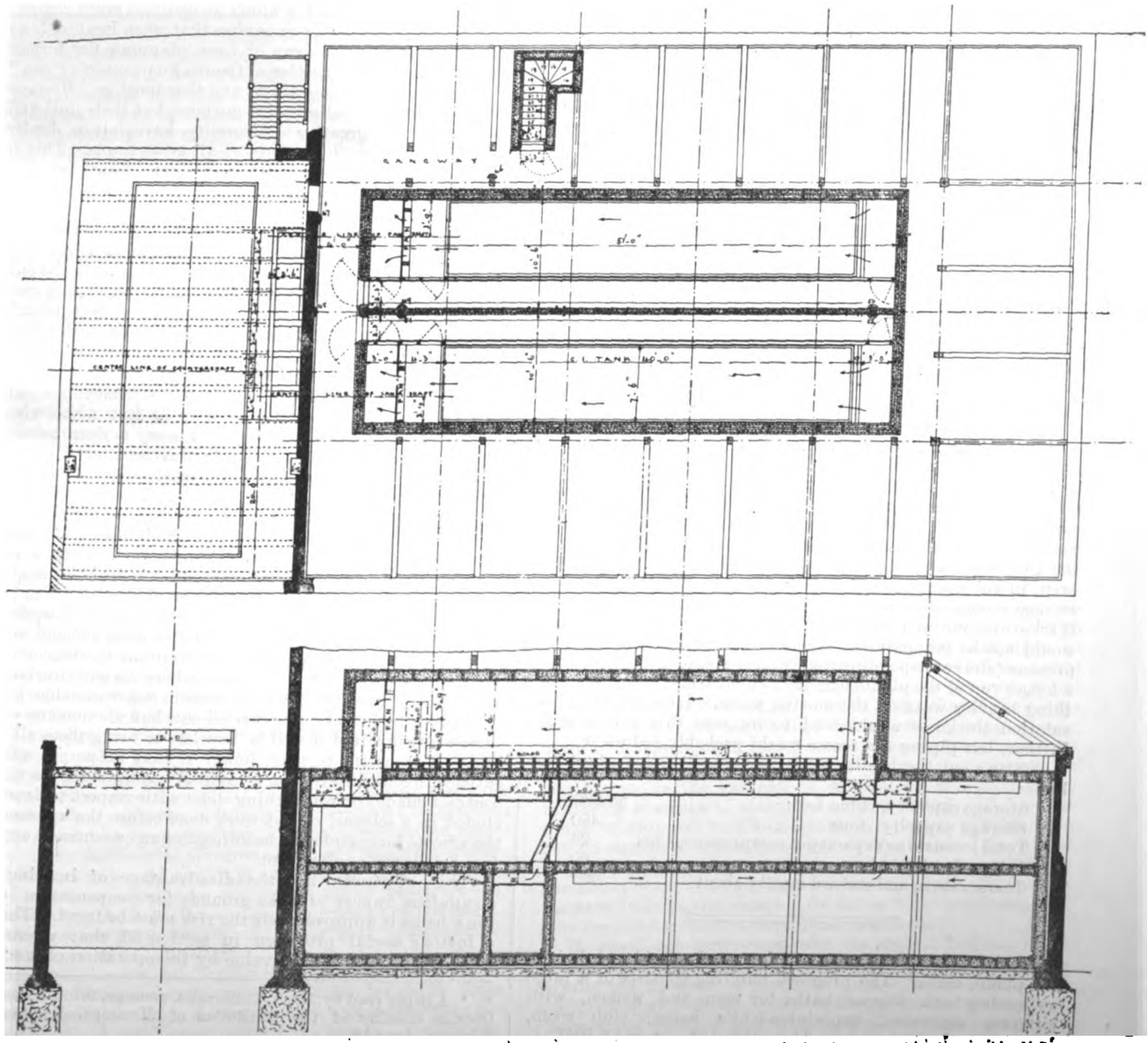


FIG. 40.—PLAN OF ENGINE ROOM, ROOF, AND AIR-COOLING ROOMS. LONGITUDINAL SECTION.

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the machinery and at the same level as the air-coolers. From these tanks the water must be hoisted to the top of the condensers, and for this purpose there are included in the equipment two centrifugal belt-driven pumps. These, in addition to the compressors and engines, are contained in an engine room of ample proportions, measuring 40 feet by 22 feet by 16 feet high, whose dimensions are calculated to display the machinery with good effect. Red tiles are used as a finish to the floor, and the walls have a dado of brown salt-glazed bricks.

The insulation of the cold rooms and air-cooling chambers includes 9 inches of silicate cotton suitably sheeted, and insulating waterproof paper is fixed between the boards. In addition all floors, to allow of frequent washing down, are covered with asphalte, and a skirting of the same material is led round the walls. It might happen, however, if the floors were left with a plain flat finish, that careless and indiscriminate packing of the goods would result in a blockage of the circulation. Consequently all the floors have been furnished with easily removable loose gratings, and cargo battens have been nailed to the walls. By this means goods are automatically prevented from being piled close up to the sides.

These are the main features of a typical cold store, and although the construction might be considerably cheapened in various ways, the plant shows as it stands very good value for the capital expended. In other words it would scarcely

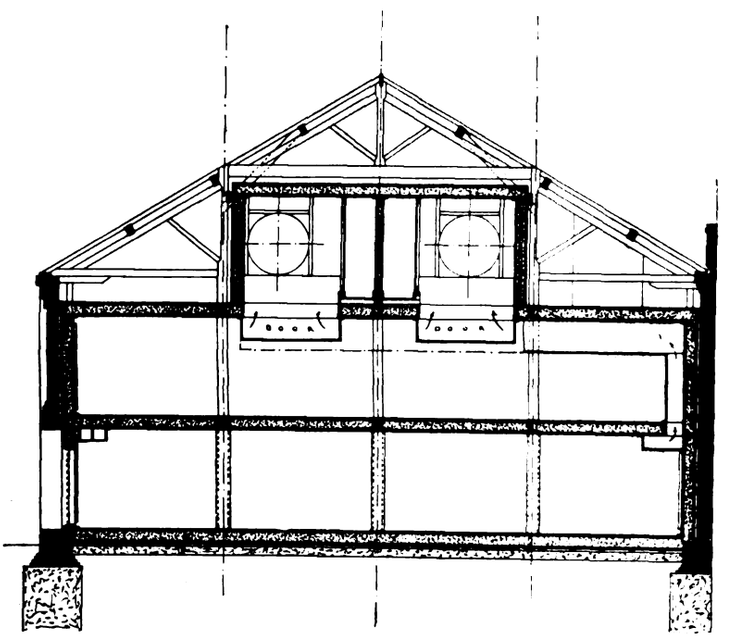


FIG. 41.—CROSS SECTION OF COLD STORES.

be economical, taking the future running of the establishment into account, to make any reduction. Should, however, capital cost be of prime importance it would be quite possible to do with rather smaller compressors, also to reduce the thickness of silicate in the insulation to 6 inches and even, in an extreme case, to replace the air circulation in the storage rooms by ordinary piping round the walls, although if these are ever used for the non-frozen goods the latter change would not be permissible. The effect of using smaller compressors (and corresponding condensers) would be to necessitate a longer run of the plant each day, which would entail for one thing heavier wear on the moving parts. Lessening the insulation thickness would tend to increase this period still further, but piping the rooms would probably reduce it.

Setting out the leading data in regard to this plant we have:—

Storage capacity, cubic feet	55,000
Storage capacity, tons	450
Total ice-making capacity of compressors, tons	24
B.h.p. developed by engines	90
Temperature maintained mostly about ...	28°

THE Wallsend Town Council last week considered designs for public baths. The proposed building consists of a large swimming bath, slipper baths for men and women, with separate entrances, superintendent's house, club room, laundry, boiler house, &c. The estimated cost was 6,594*l.*

SOME ASPECTS OF THE HOUSING AND TOWN PLANNING ACT, 1909.*

(Concluded from last week.)

THERE is no doubt some of us will soon be called on to formulate or assist in formulating a scheme of town planning. The regulations of the Local Government Board give very precise details as to the procedure which are so well summarised in Alderman Thompson's little handbook (p. 32) that I will take the liberty of quoting it. . . . Surely there is enough here to bid an overworked official to pause before launching into the intricacies of town planning; the plans and estimates alone are enough to provide work for several months, apart from his ordinary duties.

It, therefore, seems probable that the new measure will evolve a new type of municipal specialist or planning and development engineer-architect, who, by a long course of training and experience, will become an expert in the essential features of twentieth-century city making. He may be either a public officer or a private practitioner acting in a consultative capacity. There is scope enough for another profession in this Act, and Victoria Street could, no doubt, rise to the occasion. It is not suggested that the local surveyor should be altogether ignored. His co-operation is most essential to the success of any scheme, but (apart from the question of overwork), we all have our limitations, and in many instances an otherwise excellent local surveyor might make but an indifferent planner of the town of the future, if only from his unfamiliarity with urban life.

It is curious that one of the hindrances to the æsthetic development of towns should be the model by-laws; those regulations of which we are so proud and for which we claim so much benefit. The Act boldly recognises that when local by-laws stand in the way of town planning the former are in the position of George Stephenson's "coo" on the railway track, and they must go. By-laws have served a useful purpose, but their dull and unimaginative uniformity have left a deadly mark on the suburbs of all great towns. This is chiefly in regard to streets. The insufficiency of the maximum width has already been alluded to, but the formula for footways and carriage-ways, for macadamising, kerbing, and channelling is no less disastrous. Why should there never be a carriage-way less than 24 feet wide when the only possible traffic is a few light tradesmen's carts and bicycles? Why should a new street never be taken over till its footway is bordered with a hard, straight line of kerbing? By all means let us have even wider spaces between our houses, with plenty of turf and trees, but why waste money in making wildernesses of macadam 40 feet wide, which form such an eyesore in every modern suburb? In Mr. Nettlefold's useful book on Practical Housing, p. 104, there are some instructive illustrations of the remarkable improvement which can be effected in the appearance of a 40-foot road by metalling only the central 16 feet, with 5 feet gravel pathways, the intermediate spaces between path and carriage-way being turfed. Such a road would be much cheaper in first cost, and it is doubtful whether the expense of maintenance would be much more.

The early future will show whether this is to be a workable Act or not. Already several authorities have schemes under consideration, and we shall be able to profit by their experience. My own view is that in places where the outlying land is the property of one or a few owners there is a reasonable chance of successful schemes being carried out, but where many small owners are involved it will be hopeless to bring them all into line. It is useful to note, however, that no person will be entitled to compensation on account of any building erected, or contract made, or other thing done with respect to land included in a scheme, except work done before the approval of the scheme for completing buildings begun or contracts entered into before the application.

This, of course, has the disadvantage of inviting unscrupulous owners to make grounds for compensation before the scheme is approved, but the risk must be faced. There is a further useful provision in section 58, that where any property is increased in value by the operation of a scheme

* A paper read by Mr. T. C. Barralet, member, before a Southern District meeting of the Institution of Municipal Engineers at Brighton, June 18.

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the authority may demand one-half of that increase—a further development of the doctrine of "betterment."

There is no doubt that this Act is intended to work; there are no exemptions or restrictions to its operation, but many impulsive forces to set it in motion. First, the Local Government Board itself, with or without the co-operation of land owners, may force a scheme of town planning on an unwilling authority. The county councils are invested with several new functions to enforce the housing clauses and to exercise a general supervision over the sanitary work of local authorities.

They must now appoint an irremovable medical officer of health, who must not engage in private practice, and who must carry out duties prescribed by the Local Government Board. They must appoint a health and housing committee to carry out their duties under the Act, and to them must be sent all representations and complaints made to a local authority under the Act. In default of action by a local body they may act in buying land and building workmen's cottages, keep houses in repair, close and demolish unfit dwellings, and enforce inspection in the district. County councils interested in any land which is the subject of town planning schemes are entitled to receive notice of any proposal to prepare or adopt such a scheme; and it is also intended that they may make representation to the Local Government Board where they are of opinion that a local authority is in default. Similarly every parish council or parish meeting or four inhabitant householders have the power to make a representation to the Local Government Board if a rural council fails to exercise its powers under the housing sections.

Under section 72 every county council may promote the formation or extension of building societies on a co-operative basis, and may make or guarantee grants or advances to the extent of two-thirds. Local authorities are also authorised to accept "gifts" and donations for housing schemes. Evidently if the machine does not work it will not be due to insufficient greasing, but without wishing to appear cynical, we have had a good deal of this sort of thing before. County medical officers are not unknown, and although they prepare compendious annual reports full of recondite learning, and embellished with bewildering charts and tables, and are doubtless admirable public servants, they have not been hitherto a particularly noticeable driving force on recalcitrant local authorities. The Local Government Board regards the medical profession with particular reverence, and accepts its judgment on matters of drainage and construction before that of engineering experts; and it is open to question whether one of the latter would not be a better adviser to county councils, the officer for carrying this Act into execution.

Again, there is no particular reason for thinking that county councils will be much more zealous than local councils in putting the housing sections in operation. Their usual composition does not favour the assumption—I believe it is a fact that as many schemes for housing under Part III. of the Housing Act of 1890 have been overruled by the county councils as have been passed by them. The curb rather than the spur has represented their policy. Of course, all this may be changed if county councils realise the importance of the duties placed on them by the legislature; but the experience of former years cannot be ignored.

And the parish councils! Well, some of us know the parish councillor as a very respectable and quiet individual, who is firmly convinced that his first and foremost duty is to keep down the rates, and who will tell you with pride at the end of the year that the rate has never been exceeded a halfpenny, and that they have spent 5*l.* less during his term of office. Schemes under Part III. of the Housing and Working Classes Act, 1890, mean a special rate on the parish, and th is enough to make nine parish councillors out of ten look at them askance. As to the four inhabitant householders, some may be found in a few parishes; but they are not likely to be very popular persons if they do anything which involves expenditure, either public or private.

For these reasons, too, much must not be expected in the direction of spirited administration of the Housing and Town Planning Act. We are naturally conservative and cautious people, and like to move slowly "from precedent to precedent"; nor is the Local Government Board likely to sanction any schemes of a wild and impracticable nature. It may be long before we attain to the machine-like precision and symmetry which characterises the rising towns of Germany; but the civic spirit will now have an opportunity of more ample play than it has had in the past.

After all, the best driving force for legislation of any kind is to have a strong and healthy public opinion behind it. Even the best laws cannot be well administered unless they have the hearty approval of the great mass of the people. During the last quarter of a century there has been a great awakening in all questions of public health and national well-being, which inspires a reasonable confidence that the Housing and Town Planning Act has, in the main, given expression to the growing sense of civic responsibility which distinguishes the present age, and will mark the commencement of a new era in municipal activities.

PETROL AIR-GAS.

PROFESSOR C. A. M. SMITH, M.Sc., recently delivered a lecture on the above subject at the East London College (University of London). He commenced by stating that he thought it very unfortunate that some of those who were concerned in the manufacture and sale of these plants had greatly prejudiced their case by wild statements which were obviously absurd. He gave some amusing examples. One firm gave the number of cubic feet of air-gas obtainable (by their system) from a gallon of petrol. They also gave the calorific value per cubic foot of the petrol air-gas so made. From their figures the calorific value of petrol could be shown to be about 37,000 B.t.u.'s per lb., whereas in no case had any independent expert quoted a value exceeding 21,000 B.t.u.'s per lb., and the figure usually accepted was less than 20,000 B.t.u.'s. Then again, silly arguments had been used to show how much better it was to use this source of illumination. As an example he mentioned that some patentee seriously suggested that many people committed suicide by coal-gas, a thing quite impossible with petrol air-gas! Despite these childish statements there seemed to be quite a good case for the new method of illumination.

In order that the audience might fully appreciate the problems involved, the lecturer explained various matters of interest concerning the liquids employed. He mentioned that the petrol used for lighting purposes was not subject to the full tax imposed by the exchequer upon petrol used for motor-cars. Petrol itself consists of a mixture of liquids, all of which vary not only in composition, but in density. The amount of petrol which could be sucked up, under the various atmospheric conditions, varied according to the density of the stuff, and also according to the temperature of the atmosphere.

"As a matter of fact," said the lecturer, "it is not necessary with most of the plants now in use that the air should pick up very much petrol." The proportion of petrol to air in the "safety" plants was about 1½ to 98½. These plants, as was explained by means of experiments, are quite safe, always provided that they work automatically. From an engineering point of view there seemed to be no earthly reason why they should not work perfectly regularly. Of course it was quite impossible to make any mechanism absolutely "fool proof." Professor Smith seemed to favour the 1½ per cent. petrol air-gas plants rather than the saturated systems. There could be no explosion in the case of leakage, although of course that objection held for coal-gas. It was mentioned that only one firm used a low-grade oil—costing 6½*d.* a gallon—and the lecturer evidently favoured the idea of researches and experiments upon benzol. Petrol has to be imported, while benzol is obtainable from all of the gasworks. It could be purchased at a fairly low price.

The requirements of petrol air-gas plants were (1) carburation must be constant, (2) the apparatus must be self-regulating, (3) the mixture must be very intimate. It was essential that, whatever the number of lights used, or whatever the temperature of the atmosphere, there must be some automatic arrangement, so that the quantity of petrol and air measured out must be proportional to the number of lights switched on. Proper means should be taken so that all of the petrol became evaporated. The calorific value of the petrol air-gas as used in what he would call the 1½ per cent. petrol plants was about 97 B.t.u.'s per cubic foot. One of the plants used a gas of about double that calorific value, which clearly indicated that a much stronger mixture was being used.

It was necessary, explained the lecturer, to use power for the plants, as the gas had to be pumped into a reservoir against a pressure of about 3 inches of water. That power could be supplied by the lowering of a heavy weight, by a hot-air engine, or a small water or electric motor. They must not pay much attention to the statements for or against any particular form of power for running the plant—that was a comparatively trivial detail. So far as his experiments had gone the hot-air engines were quite satisfactory.

He could not understand why the makers had not made researches, or why scientific people had not done so, concerning the question of pressures used with the plants. It was quite clear from his own rough experiments that certain plants would work much more economically at higher pressures than those usually employed.

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Moderne Bauformen.*

A HOUSE AT HEIDELBERG.—Herren KUMPF & WOLF, Architects.

Curves were drawn which showed the relationship between the costs of petrol air-gas and coal-gas on a heating basis. From these it appeared that petrol at 10*d.* a gallon was equal to coal-gas of 630 B.t.u.'s at 3*s.* 9*d.*, and coal-gas of 480 B.t.u.'s at 2*s.* 10*d.* per 1,000 cubic feet. There was a point which might fairly be raised in favour of petrol air-gas, and it was that when a man purchased a gallon of petrol he knew, to within fairly narrow limits, the number of heat units which he paid for. But the calorific value of coal-gas varied enormously. It was quite probable that the man who paid 3*s.* 9*d.* per 1,000 cubic feet for coal-gas in one part of London was actually obtaining much better value for his money than the man who paid 3*s.* per 1,000 cubic feet in another part. Similarly electricity units were quite feasible and common sense.

The lecturer pointed out that all engineers owed a debt of gratitude to electrical experts for showing the advantages and the possibilities of accurate measurements. The days of rule-of-thumb "pious hopes" methods were gone and a scientific era had dawned. Accuracy of measurement and authoritative tests were essential in any branch of engineering work. They were nowhere so essential as when new inventions were placed on the market. There seemed to be real scope for petrol air-gas in villages and large country houses. There was still a great deal of data required, and there was an excellent field of research work for someone to enter. His own experiments had been possible because of the assistance of the makers of the plants exhibited, and Professor Morris, head of the college electrical department. He wished also to thank his assistant Mr. Davies and two students—Messrs. Elliot and Parsons—for their help with the tests, results of which were given. It was mentioned that the lecture would be published in book form.

NOTES ON THE USE OF PORTLAND CEMENT CONCRETE.*

THE use of Portland cement concrete has had such a rapid growth during the last few years, and its adaptability to the most unusual purposes is every month more widely demonstrated, that it behoves the municipal engineer above all others to become as familiar as possible with its characteristics and uses. There is little probability of getting to the depths of the subject in a paper of this length, nor has the writer a hope of presenting any fresh features or data for the general enlightenment, but it is well to occasionally turn over old items of information in order to brighten up half-forgotten knowledge and to keep our minds fresh to well-known facts.

The first and most important point with regard to concrete is the selection of a sound cement; the second, the choosing of a suitable and properly constituted aggregate, and the third, but by no means the least consideration, is the mixing and manipulation. Let the engineer's calculations and design be never so perfect, let the material be never so good, the apathy of the man with the shovel is sufficient to ruin the most completely arranged scheme, unless he is efficiently supervised.

It is a very general complaint that the ordinary tests for soundness as applied to cement require too much time to be of real service upon the works, as the particular consignment under notice is beyond recall before the tests are completed. It is true a known brand of cement may be specified and tests may be made of that brand extending over months prior to the commencement of the works, but a fluctuation in quality is possible with the best, and substitution and adulteration is not unknown. Again, the tests are often delegated to some inexpert individual on the works whose results are not at all convincing.

Generally one relies upon a seven days' tensile test or some more rapid and inaccurate trial, and is often satisfied with a high tensile strength which may be entirely misleading, as the cement may show a tardy increase in strength for longer periods, while on the other hand a cement yielding a moderate result of 350 lbs. to 400 lbs. per square inch at seven days may show a steady and substantial increase at fourteen, twenty-one, twenty-eight days, and onwards. Probably the best way out of the difficulty as the matter stands at present is to entrust the testing to an expert of repute, to whom the origin of the cement is unknown.

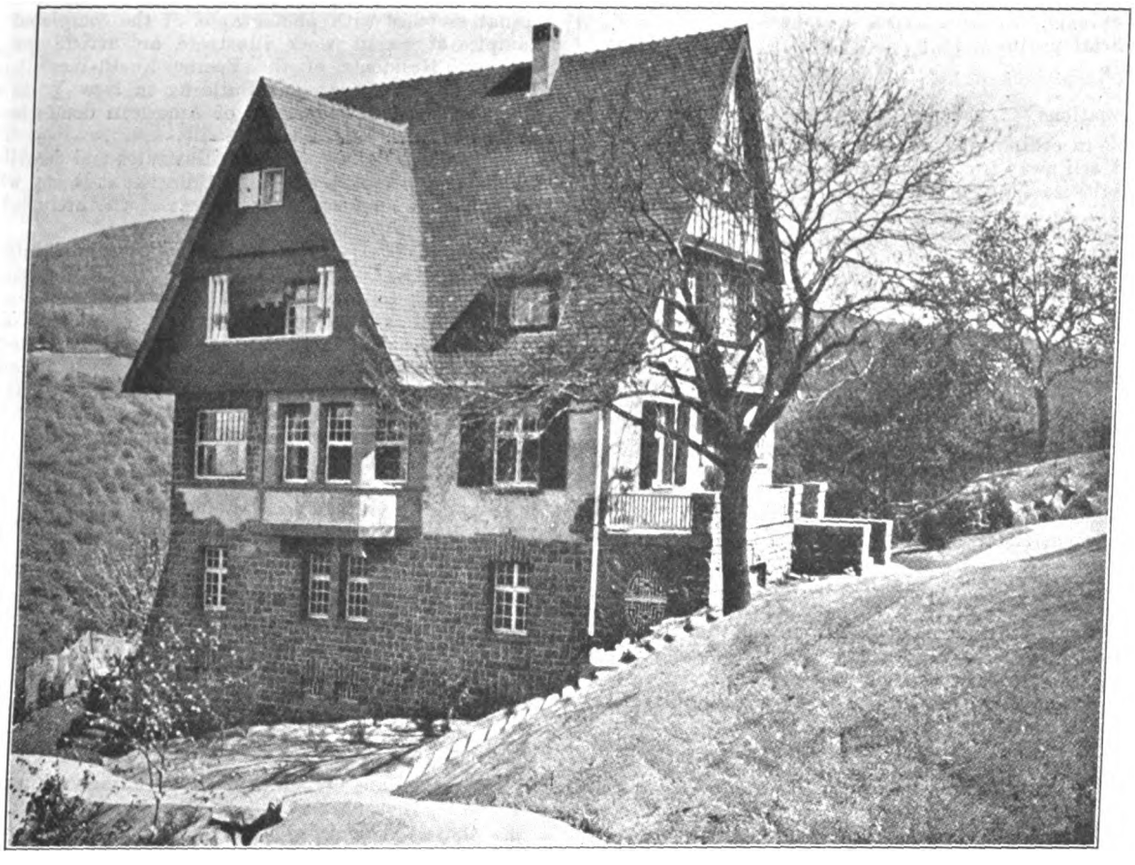
The cement should of course be stored in a dry, cool place, and although growing opinion appears to be that a good cement should need no aeration, the experience of the writer does not support this view. Batches differ greatly, and during a boom in the trade one is likely to be surprised if he pins his faith too firmly to this view.

Choice of an aggregate is often limited to local material which may be altogether unsuited to the purpose, and herein lies a cause for failure which would undoubtedly be attributed to the cement. Dr. Owens says, "It is quality in aggregate which I am convinced is responsible for the production of much bad concrete."

* A paper read by Spencer Sills, Mem. Soc. Eng., before a Southern District meeting of the Institution of Municipal Engineers, at Brighton, June 18.

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Moderne Bauformen.*

A HOUSE AT HEIDELBERG.—Herren KUMPF & WOLF, Architects.

Where strength is required, hardness and toughness in the aggregate are indispensable, but for fireproof construction other qualities have to be considered, and where lightness of construction is a matter of moment and strength is not so important a still different class of material may be used. In no circumstances should such considerations be sacrificed to the fetish of cheapness in preferring an aggregate easily procured locally to a more suitable material which has to be imported at an increased cost.

The aggregate must be clean and free from loam, clay, mould, vegetable growths, animal refuse, dust, or any matter foreign to the nature of the material, and, if necessary, it should be repeatedly screened and washed to render it suitable for its purpose. Pit gravels are often mixed with fine loamy clay, which it is safest to eliminate from the aggregate if a strong concrete is desired, and such material moreover frequently contains a quantity of softened and partially decayed stones and spongy mineral concretions which it is wise to reject for important work.

Broken brick must be freed from dust and mortar rubbish; burnt ballast must be hard burned, free from lime and sulphur and from unburnt particles; coke breeze should be from gas retorts or coke ovens, free from coal, clinker, cinder, ash, or substances which will not float on water; furnace clinker should be hard, well burned, free from dust, shale, lime, ash and metal scrap or scale; blast furnace slag should be from pig-iron furnaces, free from basic slag and well washed to remove dust and sulphur. Broken pottery or tile is unsuitable for mixing with an aggregate, as the pieces bridge over voids and prevent perfect consolidation.

An imperfectly apportioned or graded aggregate requires more cement to make a strong dense concrete than a more exact mixture, and the usual specification which simply provides a gauging of 1 to 3 or 1 to 6 does not ensure the provision of the due amount of fine material required to fill the voids.

The increasing popularity of reinforced work is thrusting home the fact that concrete mixing must needs be an exact operation which allows of nothing which savours of the old rule-of-thumb methods. All voids must be filled as completely as possible with the mortar of cement and sand, and to ensure this the aggregate must be carefully tested and the proportion of fine material adjusted to the needs of the case.

Mr. C. F. Marsh, M.Inst.C.E., quoting from the proceedings of the American Society of Engineers, April 1907,* refers to the conclusions of Messrs. Fuller and Thompson following their experiments with graded aggregates.

1. An aggregate with maximum size stones 2½ in. diameter made a stronger concrete than the aggregate whose largest stones were 1 in. diameter, and the latter was stronger than another aggregate with stones of ½ in. diameter and under.

2. For equal strength No. 2 required one-sixth more cement than No. 1, and No. 3 required one-third more cement than No. 1.

3. The relative densities of the concrete varied in a similar manner.

4. Round, water-worn material, like gravel, gave a denser mass than broken stone.

5. Angular aggregates, like broken stone, gave a stronger concrete than rounded aggregates with the same sand and cement, but an angular aggregate with angular sand or stone screenings was not so strong as the rounded coarse and fine aggregate.

6. Aggregates specially graded gave a much stronger and denser concrete than a natural aggregate.

7. Strength and density were affected very little by the decrease in quantity of the medium size stones, but were improved by the increase of the maximum size stones.

An excess of medium size stones decreased both strength and density.

8. Strength and density were affected more by variation of size of sand grains than by variation of stone particles.

9. Excess of fine or medium sand decrease both strength and density.

10. Substitution of cement for fine sand did not affect density, but increased the strength.

The importance of grading is here abundantly proved, and in first-class work the greatest attention is needed in this direction to ensure that the voids are well and economically filled.

An aggregate composed of grains of a uniform size contains the highest percentage of voids, which may amount to 60 per cent. or more of the mass—grains of varying sizes are therefore needed to effectually consolidate the concrete. The maximum

* "Concrete and Constructional Engineering." September 1907.

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size for particles of the aggregate depends of course upon the nature of the work, smaller gauge being demanded for reinforced work in order to ensure uniformity in the mass and close intimacy with the reinforcement. The usual practice is to screen through sieves of the sizes as under:—

Artificial paving	¼ in. to ⅜ in.
Floors	½ in. to ¾ in.
Walls	1 in. to 2 in.
Foundations	2½ in.

"Plums" in ordinary foundation work should be carefully deposited well away from one another and from the sides and angles of the mass, but never allowed in reinforced work.

To estimate the quantity of sand and cement required to make a sufficient mortar to form a dense concrete with the coarse aggregate, a vessel of known capacity is filled to the top with the coarse particles, and water is poured in from a graduated measure until the vessel is filled to the brim. The quantity of water required to fill up the voids in the coarse aggregate represents the proper proportion of sand. A like proportion of coarse aggregate and sand is now put into another vessel, shaken down and levelled to the top, and water is added to this from a graduated measure, as before, to ascertain the amount of cement required. Absorbent aggregates must of course be well soaked before the experiment is carried out.

The water for mixing concrete must be clean and entirely free from matters in suspension. Stagnant pond water is most unsuitable, as it is frequently swarming with animal and vegetable life and chemical impurities. Concrete requires about 25 per cent. to 30 per cent. water to form a homogeneous mixture, and the mass should be well turned dry until the whole is thoroughly mixed, and turned again quickly, when wetted, several times, until of a uniform colour. When deposited the concrete should show just wet upon the surface. More water than this floods the cement and washes it away from the aggregate, and less water does not allow of the full reaction of setting. If the aggregate is of a porous or absorbent nature, such as broken brick or stone, it should be well soaked before mixing, otherwise the aggregate will absorb water when deposited and impair the setting operation, and in these circumstances it is quite possible to get a weak concrete although using the full quantity of cement.

Accurately measured gauges for apportioning quantities upon the works is of the greatest importance, and their intelligent use a matter for close supervision. The sometime method of filling the aggregate gauge, levelling up and placing a bottomless cement gauge on the aggregate for filling, leaves too much to chance in the variation of the quantity of cement. A more accurate gauge for cement is a metal vessel, but undoubtedly the correct way is to apportion the cement by weight, taking 100 lbs. weight as representing one cube foot of sand voids.

The secret of success in concrete work lies in the knowledge of what to avoid, and may be briefly summarised as follows:—

Avoid an unknown cement delivered in unbranded sacks or casks, or one of foreign manufacture. British-made is good enough, and is branded. Avoid lumpy or caked cement. Avoid a quick-setting cement. Avoid accepting the first aggregate to hand; choose the best obtainable for the purpose. Avoid the acceptance of an aggregate on sample; see it in bulk. Avoid the use of a natural aggregate without knowing its history, and insist upon screening and apportioning sand. Avoid muddy water or water of a decided colouring. Avoid slovenly methods of gauging and mixing. Avoid sloppy concrete or semi-dry mixtures. Avoid mixing quantities of concrete which cannot be immediately disposed of. Avoid the use of dead concrete. Avoid frost, and carefully protect finished work. Avoid laying concrete in water. Avoid heavy or long-continued ramming. Avoid earth and rubbish falling upon and mixing with concrete. Avoid weak, shuttering, or sparse timbering. Avoid the removal of centreing, shuttering, or timber until the work is hard. Avoid the temptation to generalise in specifying.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) devotes itself to a thorough illustration with description and plans of the Blackstone Hotel, Chicago, which both as an example of hotel planning and of sky-scraper design is one of the best things we have seen and fully justifies the action of the Illinois Chapter of the American Institute of Architects in awarding to its architects, Messrs. Marshall & Fox, the medal for 1909 for producing the most meritorious work of the year.

The *Architectural Record* (New York) also deals with some of Chicago's sky-scrapers in an article on "Additions to Chicago's Skyline," in which full cognisance is taken of the objections on public grounds to these monstrosities of construction. "A charming house and grounds" for Mr. B. V. H. Schultz at Short Hills, New Jersey, of which Mr. Wilson Eyre is the architect, is described and fully illustrated, an interesting feature being the juxtaposition of the architect's original sketches with photographs of the completed work. Examples of recent work illustrate an article on "The Suburban Residence of the Pacific North-West," whilst "Contemporary Apartment Building in New York City" shows the latest developments of American domestic architecture in towns.

Il Monitore Tecnico (Milan) illustrates and describes the Lombardic pavilion at the 1911 exhibition at Rome, which is intended as a historical presentment of the architecture of the northern province.

The *Scientific American* (New York) has an interesting article on "The Contagious Diseases of Metals," particularly with reference to the studies of Erdmann and Fritsche on the tin pest as elucidated and completed by Professor Cohen.

Der Architekt (Vienna) is, as usual, chiefly "new-art" this month, the most pleasing example being a group of dwelling houses with shops under at Pardubitz, of which Herr Jar. Kohoutek is the architect. Other designs are a block of flats by Herr Emil Hoppe, a factory and silo at Vienna by Hubert and Franz Geszner, a girls' school at Linz by Herr J. Schulte.

Indian Engineering (Calcutta) contains an obituary record and photograph of the late Hon. Mr. W. Banks Gwyther, F.R.I.B.A.

Engineering Record (New York) gives a translation of the new German Standard Specifications for cement. Another item of some interest is a letter giving facts as to examples of failure of concrete and curbs and sidewalks by expansion.

COMPETITIONS.

BIRKENHEAD UNION.

PROPOSED CHILDREN'S RECEIVING HOME.

THE Guardians invited architects residing within the limits of the Birkenhead Union to submit competitive designs for the above. Premiums of 6*l.* 6*s.*, 3*l.* 3*s.*, and 2*l.* 2*s.* were offered to the first three premiated designs. The conditions stated that the Guardians had appointed Mr. E. Kirby, F.R.I.B.A., F.S.I., of Liverpool, to advise them in regard to the selection of the designs. About twenty sets were submitted. The inmates to be provided for were as follows:—Children, male, 30; female, 30. Officers, married couple, 2; females, 4. In addition two sick rooms were to be provided, each for two beds. Competitors were somewhat limited to cost, the condition being that the scheme nearest to an expenditure of 2,000*l.* would receive the most favourable consideration. The first premiated design is by Messrs. Nagington & Shennan, and is estimated to cost 2,500*l.*; the second premiated design is by Mr. T. T. Rees, F.R.I.B.A., and is estimated to cost 2,700*l.*; the third premiated design is by Mr. R. Wynn Owen, A.R.I.B.A., and is estimated to cost 2,430*l.*

EDINBURGH.—The Corporation have received 130 sets of designs in the Usher Hall competition which closed on Saturday last. The drawings were taken to the new Corn Exchange at Gorgie for the purpose of examination by the assessor, Sir Aston Webb, C.B., R.A., and by Mr. J. A. Williamson, A.R.I.B.A., the city superintendent of works, who is associated with him.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

A National Memorial to Edward VII.

SIR,—Suggestions have been appearing in the daily and weekly papers as to a national memorial to Edward the Peacemaker. What finer scheme could be put forward than that which would have appealed more than anything to our late Gracious King—a large central hospital in Westminster? Charing Cross Hospital might be done away with and a handsome and commodious hospital erected in the Kingsway. Plenty of land is available there which is simply lying unused, and the sale of the Charing Cross Hospital site would surely supply a goodly sum towards its upkeep. Such a memorial would be a fitting one for such a King, whose kindly interest for the suffering should surely be fittingly remembered by his grateful subjects. What a glorious architectural tribute could be shown of his people's veneration and regard.—Your obedient servant,

July 12, 1910. WATERLOO.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, July 23.

Guild of Architects' Assistants: Visit to Reinforced Concrete Water Tower at Barnet Union Workhouse. Meet at High Barnet (G.N.R.) Station or on the Works. 3.0 P.M.

Royal Archæological Institute: Annual Meeting at Oxford. Continues to July 28.

Cambridge University Extension Local Lectures: Summer Meeting at York. Continues till August 4.

Monday, July 25.

National Competition of Schools of Art, &c., 1910: Exhibition of Works of Students in the Iron Building "C," behind the Natural History Museum, South Kensington.

Tuesday, July 26.

Speech Day at Oakham School: Inspection of Fresco Paintings by Mrs. Sargant-Florence, Midland Railway, St. Pancras Station to Oakham. 10.25 A.M.

Thursday, July 28.

Kent Archæological Society in the Sandwich District (two days).

Monday, August 8.

Architectural Association: Annual Excursion, Headquarters at Harrogate. Continues till August 13.

STUDENTS' DRAWINGS AT THE ARCHITECTURAL ASSOCIATION.

ON Friday last the Architectural Association held another "annual" exhibition of students' work, which on this occasion comprised that done in the studios, where young architects learn to draw and design under the supervision of highly competent instructors.

The most attractive section of the show is that produced in the evening school, in which a four-years' course is adopted, and which, being held in the evening, is suited for pupils and assistants engaged in architects' offices during the day. The students in the evening school are therefore to some extent young men who have already learnt something of drawing and possibly of design in an architect's office, and may therefore be expected to turn out better work than the students in the day school, which is primarily intended for those who have just left the general public or secondary school, and are receiving their elementary technical training before entering an architect's office.

Unfortunately the drawings are very badly hung, the chief aim seeming to be to economise the number of drawing-pins used. As these are only the cheap German variety it is scarcely worth while, for the sake of an extra gross or two, to make one pin hold the corners of four drawings, so that the names of the authors are in the great majority of cases covered up by the edges of other men's drawings.

Then again, we presume with the object of saving a little space in the hanging of all sorts and sizes of paper, there is a sad lack of systematic arrangement such as would facilitate comparison of the work of different students. Either all the work of each man should be grouped together, so that one might see what progress he had made during the year, or, better still, all the designs for each separate subject should be hung together so that one might readily compare the various solutions of each problem. Instead of this one finds that different subjects and different men's work are placed haphazard, and it is not even quite easy to separate the work of one year from that of another without the assistance of a master or contemporary student.

The work of the first year appears to consist of drawings of ornament from the round in pencil, either in outline or shaded, which is about as good a preliminary training as could be devised, and very good work is shown. We are pleased to notice, particularly in the shaded drawings, that sufficient but no undue amount of finish is given, so that an adequate rendering of the modelling is obtained without unnecessary waste of time and labour. We particularly noted the work of Mr. C. E. HALLETT and Mr. J. B. M. WALCH.

In the second year the student commences to design, and cuts his teeth upon such subjects as a Greek Doric Agora, a Roman Basilica and a village church. Whilst the classical subjects are a good foundation for the student's introduction to the meaning of design in architecture, we are pleased to see that the Gothic subject appears to inspire the greater enthusiasm, and produces the most pleasing results. In this the designs of Mr. E. L. F. DAVY and Mr. G. W. STUART are especially commendable.

The third year finds the student engaged upon modern design rather than archæological study, and naturally in the attempt to evolve originality without too close an adherence to the doings of the past he is somewhat inclined to flounder, so that the merits of the designs are embryonic. The designs for a picture and sculpture gallery are decidedly poor, though we think that of Mr. C. W. ROGERS is the best. A study for an architectural school has apparently been obsessed with the idea that such an institution must be short of money, but Mr. A. S. G. BUTLER has evolved an exterior that is effectively simple and original. For a park entrance there are several schemes that are possessed of merit, particularly that of Mr. R. P. GAYMER.

When we come to the productions of the fourth year we find that we are amongst students who have acquired some feeling for design, though one gentleman, Mr. P. D. HEPWORTH, rather overshadows his competitors. The most striking subjects are a Valhalla for explorers and a Custom House on a bridge with a waterway below. Mr. HEPWORTH'S Valhalla is characterised by an adequate idea and good grouping of a central building with sufficiently large and well-disposed colonnaded loggie, whilst the same student's Custom House is a fine piece of composition, albeit a little reminiscent of King's Lynn.

Mr. P. M. ANDREWS has also produced a good design for the Valhalla, based upon Byzantine motives. We were particularly struck with Mr. O. HILL'S preliminary sketch for the same subject, a study in charcoal. This is an admirable method of setting down one's first conception that deserves to be more generally used by English students, for "fusain" allows rapid work, and forces the attention on mass and chiaroscuro rather than detail; hence it is essentially the medium for putting down red-hot the first general dream, and tends to the valuable line of thought that fashions the design of a building as a whole.

Mr. A. W. ROBERTSON has quite caught the feeling of the modern architecture of central and northern Europe in his design for the Valhalla, that restrained and modulated version of "new art" which has shed the eccentricity and retained the originality of the earlier phase of the movement. Mr. ROBERTSON must, however, have supposed that in the land where his Valhalla would be erected there are not a great number of explorers worthy of immortality.

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THE CITADEL MOSQUE, CAIRO.

Another subject that has produced some good work is the decoration of the central hall of a public building, for which Mr. HEPWORTH in particular shows an excellent design and a good sketch in colour. Sketches for plaster modelling by several of the students are quite good. In fact, the work of the fourth year is a complete justification, if such were needed, of the present-day method of teaching design in the Architectural Association's studios.

The work of the day school also shows satisfac ory results, and it is astonishing to see raw recruits in architecture produce such drawing and design as appear in the small farmhouse by Messrs. J. E. D. MANLOVE, T. H. F. WHITE, and H. M. WHITEHEAD, or the small country church by Mr. A. E. MAXWELL, all second year students, whilst the designs for the test subject, a pavilion in a garden, that are exhibited as their final essay at the end of their two years' training by several of the students are quite remarkable examples of "intensive culture."

An interesting side-show was the exhibition of sketches by Mr. CYRIL FAREY, a travelling student, and the studies made in the life class.

We understand that prizes have been awarded for the work done in the schools, but although we have made repeated requests for the list of prize winners, we have been unable to obtain same in time for publication this week.

SCHOOLS FOR ARCHITECTS.

THE UNIVERSITY OF SHEFFIELD.

IN common with other provincial cities in which modern universities have been established, Sheffield has included as part of its university training a department of architecture, at the desire of the Sheffield Society of Architects and Surveyors, which is associated with the Council and Senate of the University in its management.

The general scheme of the Sheffield School is based upon a two-years' course of day study, followed by three years partly day and partly evening work.

The two-years' day course is intended to give a systematic course of training for students wishing to become architects, to be taken by them before entering an architect's office, though not necessarily before they are articled.

The first-year course comprises descriptive geometry, including graphic statics and practical perspective; elementary mechanics, elementary applied construction, general ancient history and history of architecture, architectural drawing, including ornament, which is taken at the Technical School of Art.

In the second year the subjects are descriptive geometry, theoretical construction, sanitary science, applied construction, laboratory work in mechanics, including testing materials, chemistry of building materials, general history and history of architecture and architectural drawing. Visits to buildings in course of erection and to workshops, also sketching and measuring, are included in the work of each year. The time-table fills up half-days on Thursdays and Saturdays and the whole day for the rest of the week.

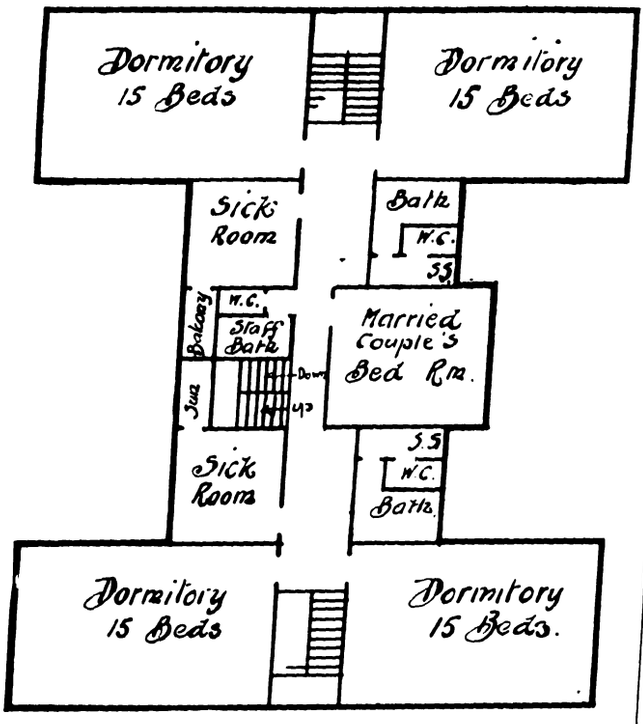
As compared with other prominent schools the curriculum of the two-years' course at Sheffield appears to be based on a desire to afford a thorough grounding in architectural knowledge rather than an attempt to transform raw schoolboys into able designers in the eighteen months net of which the usual two-years' course consists.

After the two years' day course the following three years' curriculum is intended as an advanced course for diploma, which forms a continuous course of study for students during their pupilage, and also for qualified assistants, and thus constitutes a five-years' course of training.

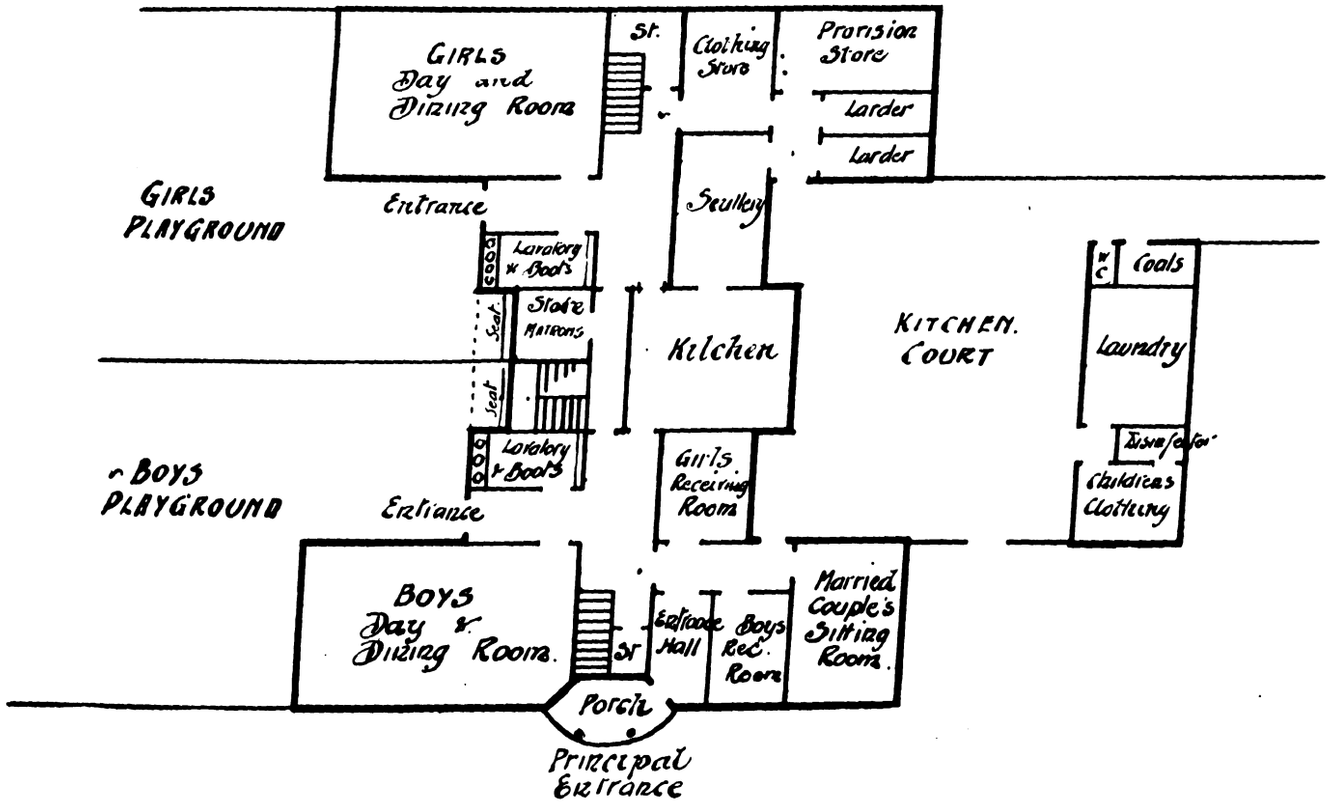
In the third year of this course students are expected to spend in each week three half-days in the University studio and one half-day at the School of Art, and in the fourth and fifth years one half-day in the studio and one evening at the School of Art. Thus the "half-timer" system, which has for long been a feature of elementary education in the North of England, is extended to architecture, and the architects of Sheffield who take pupils are prepared to make their office arrangements accord-

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COMPETITION FOR PROPOSED CHILDREN'S RECEIVING HOME, BIRKENHEAD UNION.



FIRST FLOOR PLAN.



GROUND FLOOR PLAN.

FIRST PREMIATED DESIGN.—By Messrs. NAGINGTON & SHENNAN.

ingly. This justifies the basis of the two years' curriculum of the day school, and, in our opinion, is better for the student than the London system of two years' hot-house forcing and intensive culture.

Besides his half-day attendances the Sheffield student gets in the third year four hours of evening lectures, in the fourth year three hours, and in the fifth year four hours, which is enough, but not too much, for those who are working in offices or studios during the day. During these three years design is taught, as well as the other subjects that are recognised in the Final Examination of the R.I.B.A. as essentials in the education of a young architect.

NOTES AND COMMENTS.

THE discussion on the improvement of Buckingham Palace goes merrily on with the natural difference of opinion amongst those who, as members of Parliament for London constituencies or of the London County Council, consider themselves entitled to speak for the people of England. The majority of those who have spoken seem to be in favour of doing something.

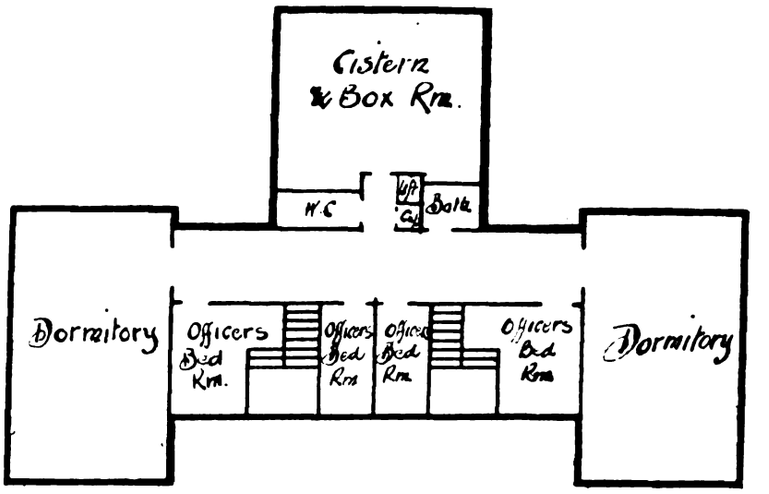
MR. HARCOURT, in answer to Mr. BOTTOMLEY in the House of Commons, has stated that the approximate cost of re-fronting Buckingham Palace in stone to an improved design would be 150,000*l*. But, as Mr. LUTYENS has pointed out, simply to substitute a new Portland-stone front for the present painted one would be hardly worth doing, and this not only by reason of the limited scope for architectural design that such a course would impose, but for the practical reason that a façade in Portland stone facing east-north-east would in London become black, and would not take on the charming weathered white that we see in some parts of St. Paul's and the Law Courts.

ALDERMAN SWINTON, L.C.C., also calls attention to the lack of play of light and shade that results necessarily from a straight front with the aspect that Buckingham Palace has towards the Mall.

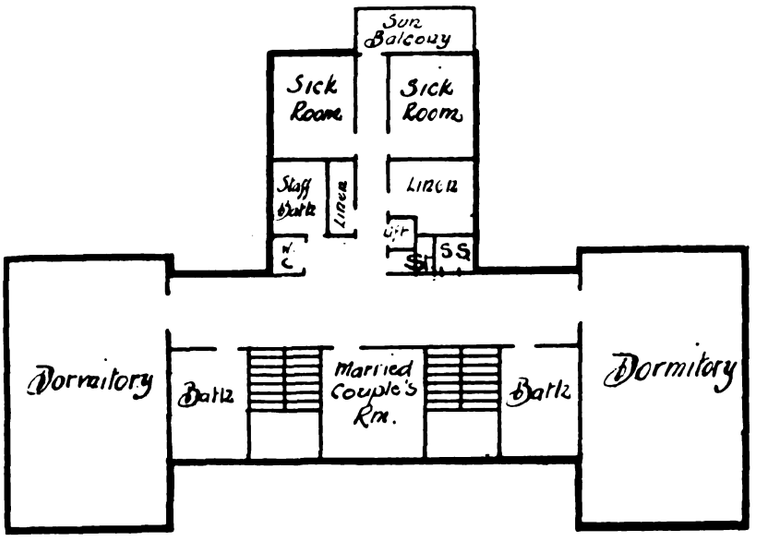
WE are strongly of opinion that a new front at a cost of 150,000*l*. would be a sheer waste of money, and that any real improvement to the external appearance of the Palace as seen from the Mall must be accom-

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SECOND FLOOR PLAN.



FIRST FLOOR PLAN.

SECOND PREMIATED DESIGN.—By Mr. T. T. REES, F.R.I.B.A.

panied by a vital alteration of the plan, and we agree with the dictum of Mr. F. L. DOVE, L.C.C., who, as a practical builder, knows what he is talking about when he says:—"It will be far more economical in the long run to entirely rebuild, rather than tinker with the present building."

THE difference in the effect of weathering on Portland stone that follows variation of aspect, which was mentioned by Mr. LUTYENS in the discussion of the Buckingham Palace façade, has a bearing on the question raised by Dr. TEMPEST ANDERSON in his paper read before the Museums Association, which we give on p. 60.

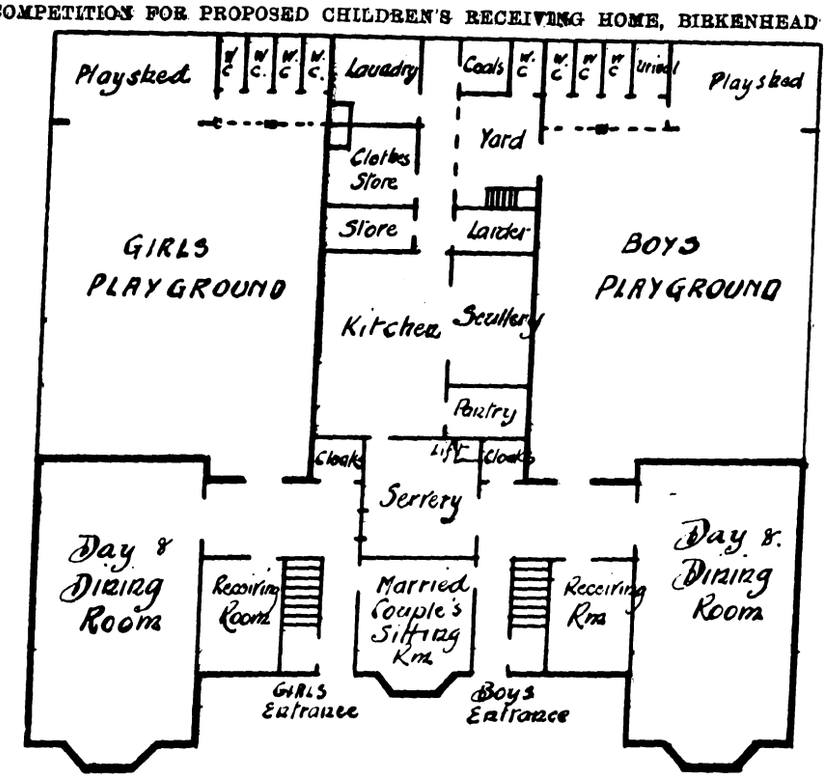
WHEN we look at the southern side of St. Paul's Cathedral we can exactly determine where the sun's rays fall upon the stonework and where they do not. Sun-touched surfaces are white, the shaded ones black. Many years ago this was explained by some one, we forget whom, as due to the growth of lichens which could grow in shade but perished in the sun. This seems to us more credible than Mr. LUTYENS's reference to wet southerly winds. For there are black surfaces at St. Paul's just as much exposed to wet and wind as white ones. In the discussion on Dr. ANDERSON's paper it may be noted that Mr. E. M. HOLMES mentioned two specific lichens that secreted oxalic acid and so attacked stonework. Whether bacillus or lichen there clearly exist some low organisms that can live on shaded Portland stone and turn it black, but cannot bear the sunshine. The same truth is beginning to be manifest on the Law Courts

THE point of law decided by Mr. Justice LAWRENCE in the case of HODGE *v.* Urban District Council of Matlock Bath, and SCARTHIN, NICK and NUTTALL, which we report elsewhere, is of some importance to architects who often when employed by a public authority or corporation have a difficulty in obtaining a "contract under seal" as part of their instructions.

IT is satisfactory to know that Dr. A. C. HOUSTON, the Director of Water Examinations to the Metropolitan Water Board, is able in his fifth report to affirm the correctness of the discovery that has been made, that adequate storage of water practically eliminates the possibility of epidemic water-borne disease, so that whilst

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GROUND FLOOR PLAN.

SECOND PREMIATED DESIGN.—By Mr. T. T. REES, F.R.I.B.A.

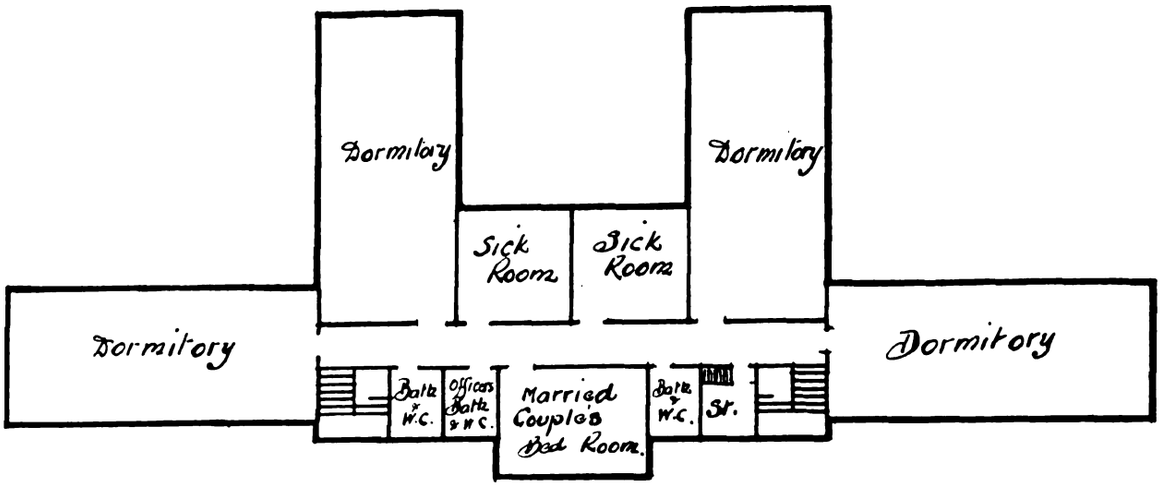
the present epidemic of cholera raging in Russia may justifiably lead to a fear that the cholera bacillus might be introduced into this country, its detection would be speedy, and our fears may be allayed by the knowledge that the cholera vibrio dies quickly in water under proper storage conditions. In the water supply of country houses architects have sometimes to arrange for the taking of water from streams which are always liable to pollution. It is well, therefore, to know that storage will minimise the danger of such pollution.

AN interesting point has been raised before Mr. Justice JOYCE in the case of CLARK *v.* Lloyds Bank, Ltd., the plaintiff being the lessee of premises from the defendants. Mr. Justice JOYCE, in giving judgment, said that this was an action by the owner of a private hotel somewhere in St. James's against his lessors, who were constructing large and extensive buildings upon a site adjoining the hotel which had already been cleared. The case had been before his Lordship several times during the demolition of the old buildings and now the work of reconstruction had commenced. His Lordship had no doubt that the works did cause a serious annoyance to the plaintiff, and were very injurious to his business. He had tried to induce the parties to come to some reasonable arrangement as to how the work was to be carried on in the early hours, but he had not succeeded. That being so the matter had been dealt with and discussed in several cases—BAMFORD *v.* TURNLEY, before the Exchequer Chamber; and HARRISON *v.* Southwark and Vauxhall Water Company, before Mr. Justice VAUGHAN WILLIAMS. His Lordship had also been referred to the later cases—BROWNING & HESELTINE *v.* HARROD'S Stores and STUMP *v.* BYWATER. His Lordship would have been glad if he could have seen his way to make a similar order to that which was made by Mr. Justice BUCKLEY in BROWNING & HESELTINE *v.* HARROD'S Stores, where that learned Judge had restrained the using of a steam crane before seven o'clock in the morning; but in the face of what was said by the Master of the Rolls on appeal in that case, he did not feel that he could make such an order, though possibly the Court of Appeal might do so. The motion must be refused.

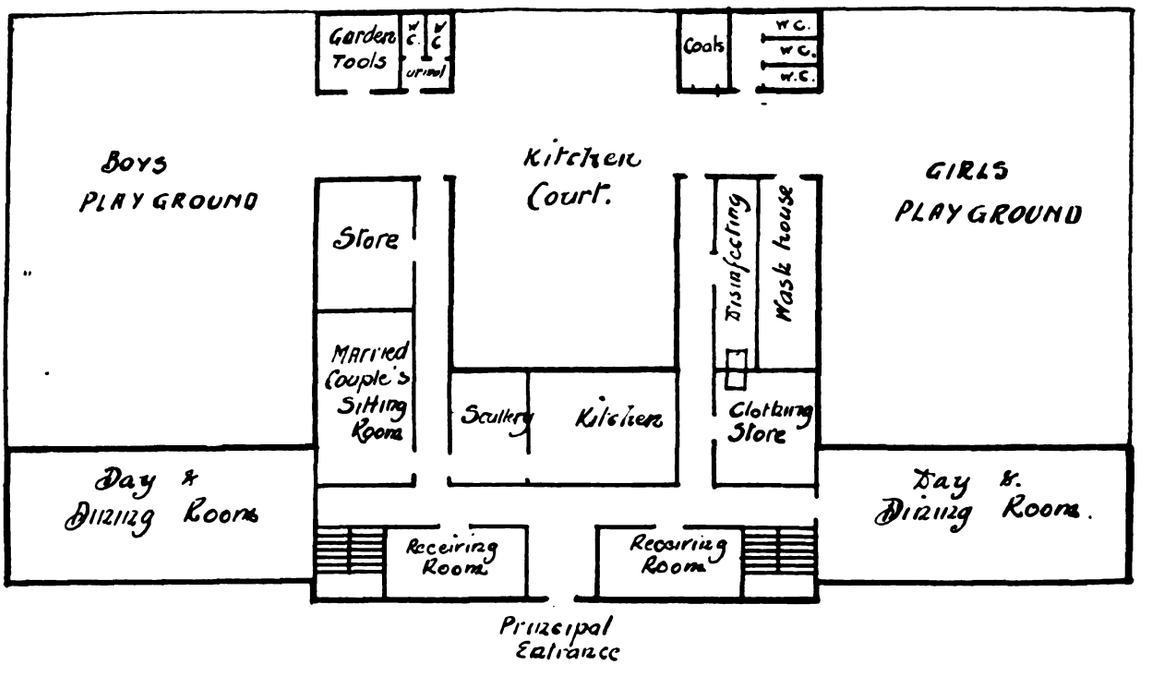
ONE of the greatest difficulties in connection with unemployment was touched upon by Sir WILLIAM MATHER at a luncheon given by the Lord Mayor of MANCHESTER to members of the Association of Technical Institutions when he said that we were creating unemployables day by day in this country. He believed there was no other country in the world where the unemployable were so perfectly trained. One reason for this was that the parents of the country, both of the richer and the poorer classes, had been for ages the most indifferent people on the face of the earth to the importance of the higher education of their children. For generations there had been little systematic attention given to the proper education of the people. It was only the faculty that had been bestowed upon the Anglo-Saxon race of somehow knowing how to do things without being able to explain why or how they did them, and of doing them with an indomitable energy that was the admiration of the world, that had enabled us to achieve so much as we had. Because they had achieved a great deal English people flattered themselves with the idea that they did not need the sort of education that the Germans or the Americans needed, and it had become embodied somehow in the mind of the English people, especially the working classes, that we were an unconquerable race in all respects. Those who travelled and those who knew what other nations were doing had long since seen the falsity of that notion. In the modern developments of agriculture and of mechanical and chemical processes we had been at a very considerable disadvantage, and our disadvantage had arisen from the fact that it was only in recent years we had realised that this desirable industrial rivalry between the nations of the world required of the English people a much higher standard of intelligence and training than they had used in the past.

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FIRST FLOOR PLAN.



GROUND FLOOR PLAN.

THIRD PREMIATED DESIGN.—By Mr. R. WYNN OWEN, A.R.I.B.A.

THE meeting of the British Association this year will be held next month at Sheffield. Earl FITZWILLIAM is President of the local committee, and Alderman H. K. STEPHENSON is local Treasurer. Receptions and garden parties are to be on a notable scale, especially a great joint reception at the University and the Mappin Art Gallery, with over 4,000 guests. The Duke and Duchess of NORFOLK will receive at the University and the Earl and Countess FITZWILLIAM at the Art Gallery. The headquarters of the Association will be at the Cutlers' Hall, and all the twelve sectional meetings will be within very easy distance of the headquarters of the Cutlers' Company. At the Cutlers' Hall will be the reception-rooms, luncheon-room, post-office, smoke-rooms, conversation-room, correspondence-room, reading-room, and so on, as well as the secretarial offices. The whole suite of the Cutlers' Company's rooms will be called into use to properly house the Association. Most of the halls in which the sections will meet are within a few minutes' walk of the Cutlers' Hall—a fact which members who have been in the habit of attending the Association meetings in some other towns will highly appreciate.

AT a meeting held at the Town Hall, on July 13, presided over by the Lord Mayor (Earl FITZWILLIAM), and attended by about fifty representatives of local authorities, voluntary associations, and manufacturers of the district, a Sheffield and District Branch of the Smoke Abatement League of Great Britain was formed. The National Association is less than a year old, and it owes its origin to Sheffield, having been the outcome of a conference held in the city. The objects of the branch are to educate the public in the matter of smoke prevention, and to secure united action. One of the planks in the platform is to secure a change in legislation which will enable local authorities to take action against smoke of any colour which is so dense as to be a nuisance. A reservation is made in the case of trades in the working of which smoke can be proved to be indispensable. In the interesting speeches made at the meeting there were many references to this question of the necessity of smoke in the steel trades, and some plain things were said about the attitude of manufacturers.

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THE LATE W. J. NEATBY.

AN APPRECIATION BY ERNEST RUNTZ, F.R.I.B.A.

THE death of Mr. NEATBY will have caused sincere regret to those architects who had the pleasure of being associated with him. Modest to a degree and without an atom of commercialdom in his constitution, he was an artist in the best sense and was never more happy than when he was associated with an architect in the clothing and adornment of a building.

I know nothing of his earlier days or what was the incentive in placing him in the position to exercise his talents. I first met him at Messrs. DOULTON'S, where he had succeeded TINWELL as modeller, and I venture to say that NEATBY'S work with that firm was not only pure, but original, for he had a keen appreciation of the necessities and suitability of ornament in connection with architectural proportion and detail. Constant intercourse with this artist and gentleman enabled me to see the brilliancy of his many-sided abilities, whilst I was filled with regret that his genius was not properly appreciated.

As an architect one had only to indicate the general idea of a decorative feature, whether in modelling or in mural decorative work, and NEATBY caught the spirit of the undertaking and seemed to think of nothing but perfecting the seeds of an inspiration; he worked with one—he was receptive—and on only one occasion have I known him to rebel against a general scheme of decorative work, and for that I can excuse him, for his whole heart in this instance was wrapped up in his particular conception.

His versatility was remarkable; he was a worker in metal, glass, and ceramic work, and in addition was a masterly executant of oil-painting for decorative work, and a dainty exponent in water-colours and miniatures. Many choice works of his are spread about the country, and a few remain as a legacy to his widow.

Of recent years Mr. NEATBY has been, I believe, the chief designer of wall papers to Messrs. LINE & SON, and it needs only to refer to his charming advertisement, "Studies in Harmony," which is to be seen in the Underground rolling stock, to indicate the refinement of mind and execution which always characterised his work. To my mind NEATBY and his work were never fully appreciated; but for those who knew him, his unostentatious ways, and his undoubted genius, there has arisen a gap which will take a lot of filling, although his son is following in his father's footsteps.

Personally I feel I have lost a friend and an ally in my art and profession—I know of no one who can quite take his place. I believe there are other architects, too, who will feel the loss of his gifts, which have helped to make our buildings beautiful, and I have therefore written this appreciation of a man of many parts, whose work, like so many others, has been ignored during this life, but whose great abilities may and should be appreciated now that the busy brain and hand are laid to rest.

ROYAL ARCHÆOLOGICAL INSTITUTE.

By OUR SPECIAL REPRESENTATIVE.

THE summer meeting of the Royal Archæological Institute opened at Oxford on Tuesday the 19th inst. with a visit to the Town Hall, St. Aldate's, where (previous to the reception by the Mayor) a description of the Corporation plate was given by Mr. W. H. St. John Hope. None of it, he said, was of earlier date than the end of the sixteenth century. The great mace was the largest one of its kind in the country, and was made in 1660; the only bigger one of any kind is the one belonging to the serjeants-at-arms, which is deposited in the Tower. The display of plate was, in his opinion, nothing like that which can be made by such towns as Bristol and Norwich. The plate belonging to the City of London is almost entirely modern. One of the most noteworthy pieces at Oxford was the solid gold cup dating from 1680, presented by George, Duke of Buckingham. Such cups were usually silver-gilt, the only other similar instance of one of solid gold being the cup possessed by the Corporation of York. The story of maces began with the time when the serjeants-at-arms went about the country arresting people. For that purpose they needed a serviceable weapon capable of not only knocking a man down but of breaking his head, if he resisted. In course of time the mace became ornamental and of silver, while the business end with its projections was scon smaller than the large knob at the other. Finally the mace grew larger and larger as it lost its original utilitarian use.

Sir Edward Braybrook, C.B., Director of the Society of Antiquaries, in the course of the brief subsequent discussion, said that the Society of Antiquaries was one of the few bodies which possessed the privilege of carrying a mace and of appointing a serjeant-at-arms. But the mace is an unworthy one, with which the Council have for a long time been dissatisfied. Some time ago they requested Mr. St. John Hope to prepare a design for a new mace, and they hoped at some future time to be able to show a mace that was worthy of the Society.

The inspection of plate was followed by the arrival of the Mayor of Oxford, accompanied by a representative gathering of councillors. The Mayor said that he wished to welcome the Royal Archæological Institute to the city. They felt it was an honour, though one of which Oxford was not unworthy. If the University was ancient, the city was more ancient still. The great characteristic of everything to be seen in Oxford was that it was connected with living things rather than with dead things; and it was in the latter that some archæologists were chiefly interested. Oxford can show comparatively few of the dry bones of history. The old buildings erected for the earliest students of the University stand to-day sheltering their successors. It was no small thing that the objects in and around Oxford are in a setting of natural beauty. The Mayor concluded by expressing his confident hope that the conference would prove one of the most memorable and enjoyable in the annals of the Institute, and that they would go away feeling that there was not another city in the world like Oxford.

The Town Clerk, in supporting the welcome, said that they at Oxford had visitors from many lands, some of whom did their ancient city in a few hours and left with mingled impressions of guide books and picture postcards. But the Archæological Institute found pleasure and delight in the systematic investigation of ancient things. For that reason they received a very special welcome. A thousand years back the city was fortified. But it lost its city gates a century and a half ago; while its walls, or the relics of them, form a background for a college garden and are part of a motor garage. Its old churches have been mostly swept away in order to widen the streets; its castle has been put to the base use of a prison. But with all this Oxford was proud of its history and liked to assert it. There was not now any antagonism with the University authorities, yet they sometimes had to impress it on the latter that compared with the Corporation the Universities were but as children. It would be remembered that the late Mr. Cecil Rhodes placed his funds in the hands of trustees because in his opinion the University authorities were but as children in finance. In the detailed programme of the meeting the date of the first college was put as 1272. But Mr. Parker puts the date of the city as five centuries before that.

The official welcome was replied to by Professor W. Boyd Dawkins, vice-president, who alluded to the unavoidable absence through sickness of their president, Sir Henry Howorth. He remarked that the last visit of the Archæological Institute was as far back as 1850. On the present occasion their numbers were 170 strong, which was double that of their previous visit, and unprecedented in the history of their summer meetings. It was undoubtedly true that the University was there because the city was there in the first place. The city although lacking in old ruins was full of historical monuments of the very highest value.

Sir Edward Braybrook, C.B., the treasurer of the Institute, also returned thanks to the people of Oxford for allowing them to see all the buildings. If the ten days of the meeting were devoted to the city they would yet be unable to exhaust its charm.

The Institute then adjourned to the Sheldonian Theatre, where they were welcomed by Sir John Rhys, pro-vice-chancellor.

The serious work of the Institute commenced in the afternoon with a visit to the Divinity School, which Mr. St. John Hope described as the most magnificent room in Oxford. A detailed account was given of its wonderful stone-vaulted roof and its heraldry and badges. An account of it, together with an illustration appeared a short time ago in *The Architect*.

Mr. Falconer Madan followed with a general account of

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the Bodleian Library, which has also been recently described in our pages in connection with the series of Oxford Colleges. Then the party passed through the Proscholium (1610) into the Schools Quadrangle. The plan of it, said Mr. Madan, was like an allegory, for it exactly followed the mediæval system of education. The undergraduate on joining the University entered through the main gateway, and going in at the first door had to fight his way successively through the different professors' lecture rooms round two sides of the quadrangle until at the end of a four or five years' course he had reached the point where he had to choose which of the superior courses he would pursue. The Bodleian was reached by a staircase entered through a door in a corner of the quadrangle, and of this a brief examination was made.

On leaving the library visits were paid to Brasenose College (*The Architect*, September 24, 1909), and All Souls College (*The Architect*, June 3, 1910), which were described by Mr. E. W. Allfrey, M.A., and Professor C. W. C. Oman respectively. The last visit of the afternoon was to the University Church of St. Mary the Virgin in High Street, which we hope to describe in our next issue.

At the evening meeting in the lecture room of the Ashmolean Museum, Mr. Aymer Vallance read a paper on "The Development of the Oxford College Plan," which was accompanied by lantern illustrations. The predecessor of the present-day college was, of course, the numerous halls. The process of absorption continued right up to the present day, when only one—St. Edmund's—remains; and it is no secret that even that is coveted by Queen's College. The halls were little more than hostels for the accommodation of undergraduates, whereas a college was founded and incorporated in perpetuity, and was regulated by most detailed statutes. It was constituted to enable undergraduates to engage in advanced studies coupled with the obligation to carry on certain specific religious services for the intentions of the founders and benefactors.

A college structure comprised a common gate with porter's lodge, a dining-hall, buttery and kitchen, lodging for the head of the house and humbler accommodation for the rest, muniment room and bursary, library, chapel and common room. The oldest existing college buildings are those of Merton. The first court only vaguely assimilates to a quadrangle, but the Mob quadrangle virtually constitutes one. The two preceding colleges and the three that came next were content to assimilate existing tenements.

The most potent influence ever brought to bear on college architecture was that of William of Wykeham, who in the New College he founded in 1379 formulated and stereotyped once and for all the collegiate plan. The chapel is on the north side and his buildings are in a perfect quadrangle. In some important respects he was a daring innovator. A chapel placed in one block with the hall in such wise that the former culminates in a blank east wall had never been known, and was flagrantly at variance with church traditions. He introduced the familiar square entrance tower with stair turret at one corner. His tower at New College (1380-85) exhibits a four-centred arch, fully 100 years before the Tudor reign.

The plan of the dining hall or refectory is almost identical with the great hall of a mediæval house with a dais and bay window at one end and the entrance at the other. It was invariably warmed by a brazier, the smoke escaping by a louvre. Side fireplaces were substituted in the eighteenth century. The hall used formerly to serve also as a common room.

Although nowadays a set of rooms consisting of one large and one small room (with or without a small closet or store-room) is occupied by only one man, up to 1714 they had to accommodate two, and sometimes three or even four. The larger room was then used for sleeping purposes. The change to modern ideas was of the utmost importance, for further accommodation became imperative. The first attempt to provide it was by forming garrets in the roof, and then by adding an entire extra storey, or lastly by rebuilding everything on a larger scale.

A chapel was not included at the outset in the college foundations, chiefly owing to the necessity for respecting the rights of the parochial clergy. Queen's College was the first and New College the next to do so. Henceforward a chapel was recognised as a normal factor. A peculiar feature of them is what may be called the Wykehamist ante-chapel, since it was introduced first by that prelate. His plan comprises a choir and a short nave of equal width in one range, together under one continuous roof, and without a chancel arch. The nave is flanked by aisles. Wykeham by his ante-chapel provided room for formal scholastic disputation, and for making the solemn station in front of the great rood on feast days before High Mass, and what was most important of all it afforded space for at least four altars additional to the customary three.

Wykeham was also the first to introduce a cloister, making it an unattached appendage to surround his graveyard. At Magdalen in 1475 it was designed as part and parcel of the quadrangle, though this was never used as a cemetery; this same plan was to have been repeated by Wolsey in his Cardinal College. Though they were never generally adopted numerous instances of a piazza occurred, a library being frequently placed overhead.

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 36, MR. JOHN P. OSBORNE, F.R.I.B.A.

MR. JOHN P. OSBORNE is one of Birmingham's prominent architects, and as such is well known in the Midlands.

NO. 37, MR. E. J. MAY, F.R.I.B.A.

MR. E. J. MAY belongs to the "Norman Shaw group" of present-day architects, and is distinguished for the excellent character of his domestic work.

CHURCH OF ST. ALBAN, ROMFORD.

THE designs for this church, which have been passed by the Incorporated Church Building Society, are for a building to take the place of a small existing mission church, the chancel of which is to be retained to form the Lady chapel for the new church. The exterior walls are to be built of red brick with stone dressings, and the roofing to be of green slates. The internal walls are to be lined with stock bricks. The continuous nave ceiling will be constructed with steel ribs buried in reinforced concrete and panelled with fibrous plaster for decoration. The floors are of wood block throughout. Return stalls only are provided in the chancel for the clergy, as it is proposed to place the choir and organ in a structural west gallery. The estimated cost will be about 7,000*l*. The architect is Mr. ARNOLD H. HOOLE, and the drawing from which our illustration was prepared is now hung in the Royal Academy Exhibition.

HOSPITAL AT HOUNSLOW.

THE drawing shows the front or south elevation of the proposed new hospital to the Staines Road. The building is planned with the administrative offices such as nurses' dining-room, matron's office, doctor's and committee-room on the south side. It is proposed for the present to use the latter two rooms as the out-patients' department, and this can be done without taking such patients into the main hospital corridor. These rooms are entered from a wide corridor running the full length of the administrative block and giving access to the two ward blocks, and the operating-room with north light. Each ward block consists of two wards, one of ten beds and one of two beds, with nurses' duty-room, bath-room, a sanitary annexe, linen and patients' clothes-stores. The kitchen, &c., is shown at one end of the long corridor, and in the drawing this is balanced by a proposed children's ward, but it is not contemplated to build the latter nor the upper storey to the ward blocks which would increase the capacity of the hospital to fifty beds until required by the increased needs of the district and the necessary funds have been collected. The architect is Mr. J. ERNEST FRANCK, A.R.I.B.A.

COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

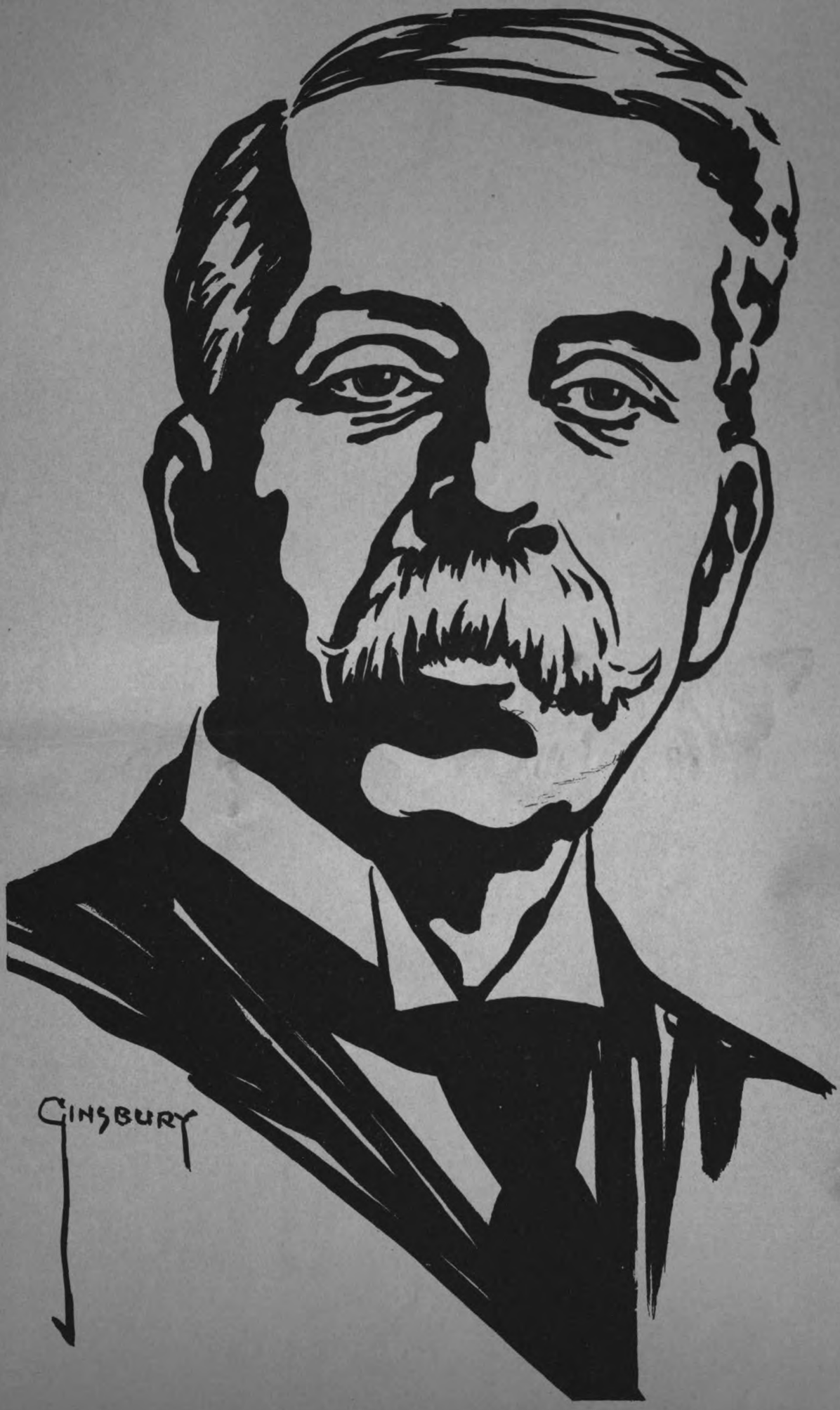
IN this perspective drawing Mr. HORTH has expressed the competition design that he submitted for the recent competition for new offices at Reading for the Berkshire County Council, in which the conditions prescribed the use of red brick and Portland stone. The drawing is now on view at the Royal Academy Exhibition.

MESSRS. A. O. EVANS, WILLIAMS & EVANS, architects, Pontypridd, have been instructed by the local Board of Guardians to prepare plans for the erection of a nursery to accommodate forty children.

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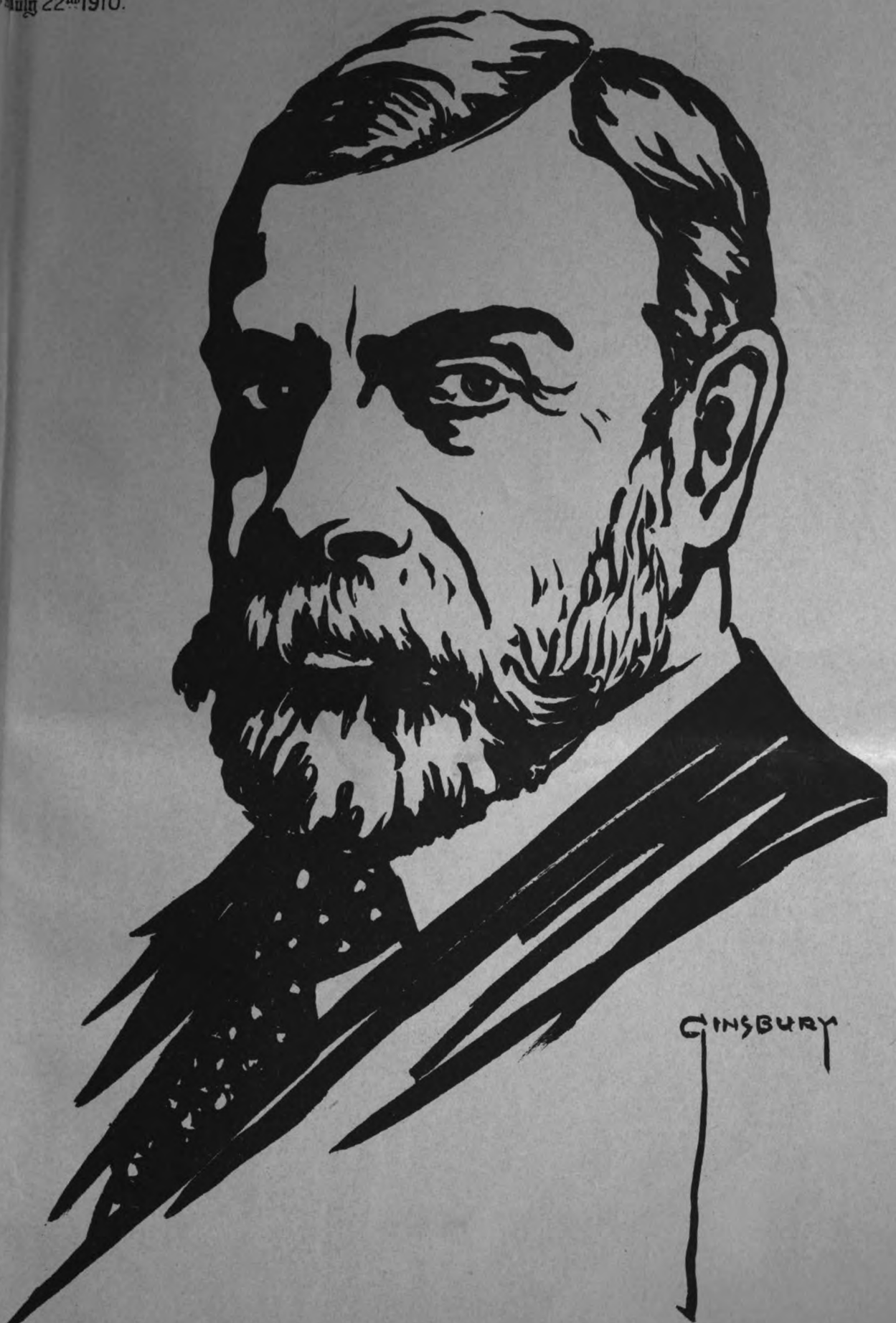
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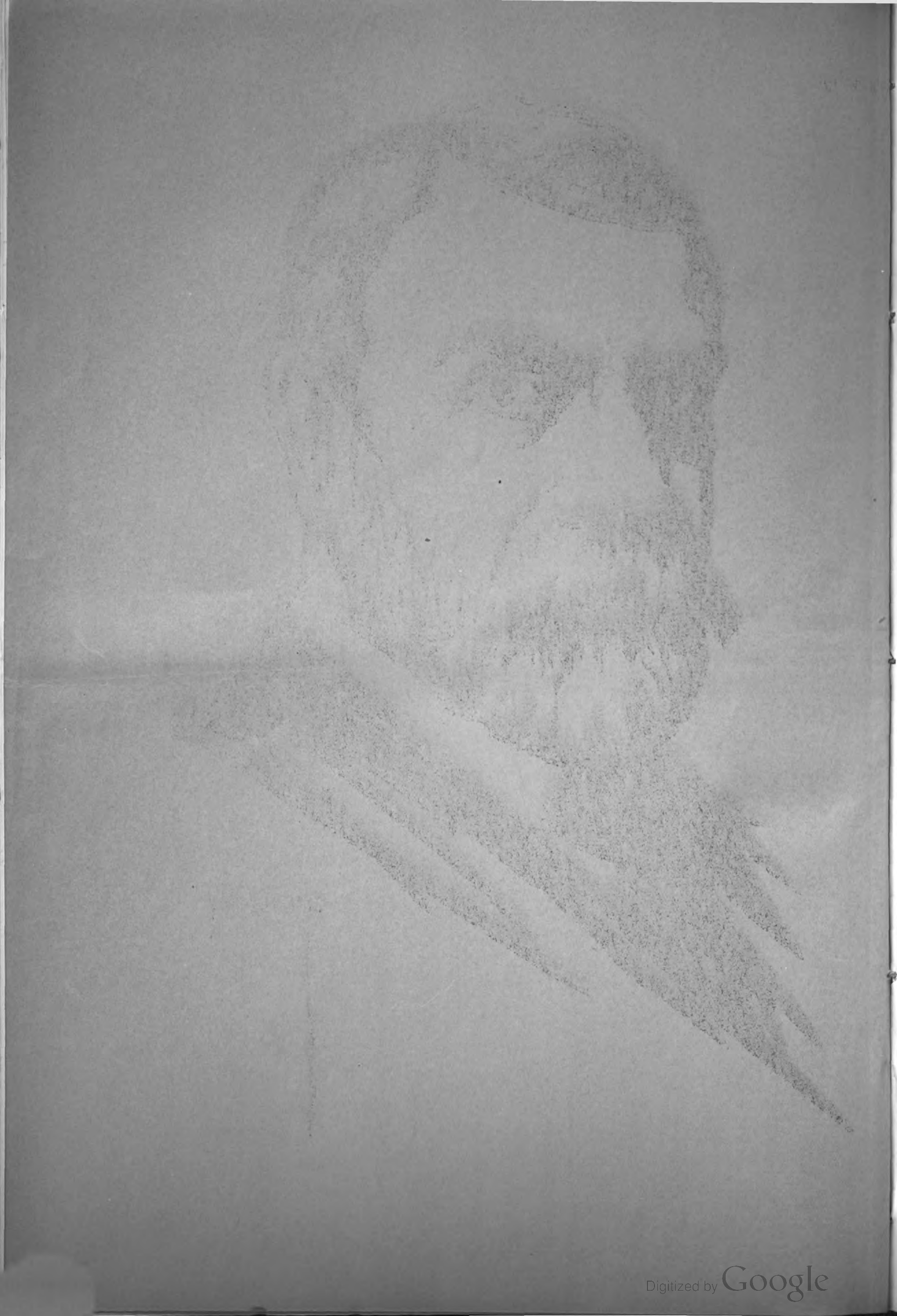
LIVING ARCHITECTS. No. 36: MR. JOHN P. OSBORNE, F.R.I.B.A.

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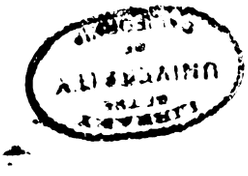


LIVING ARCHITECTS. No. 37: MR. E. J. MAY, F.R.I.B.A.

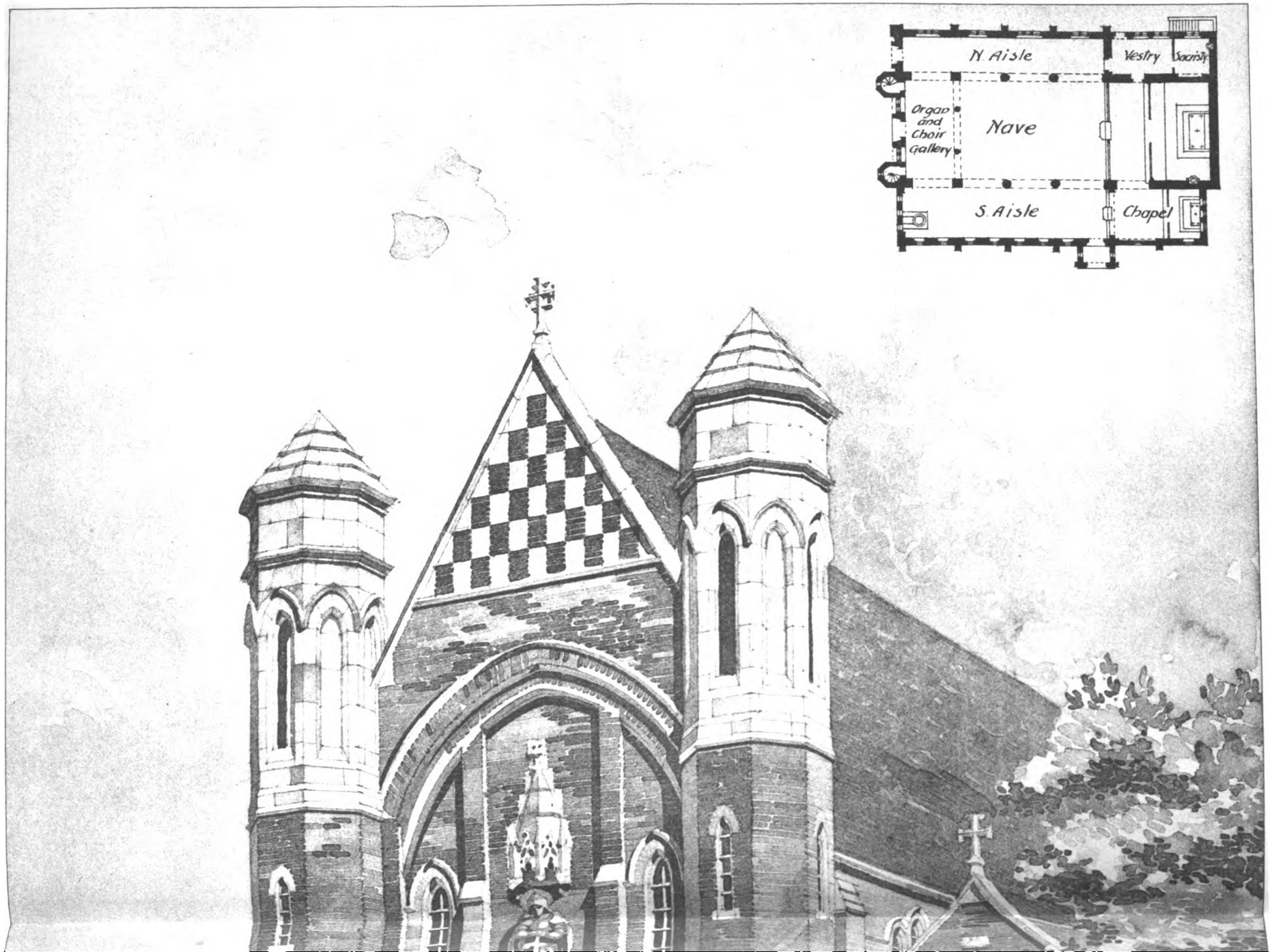
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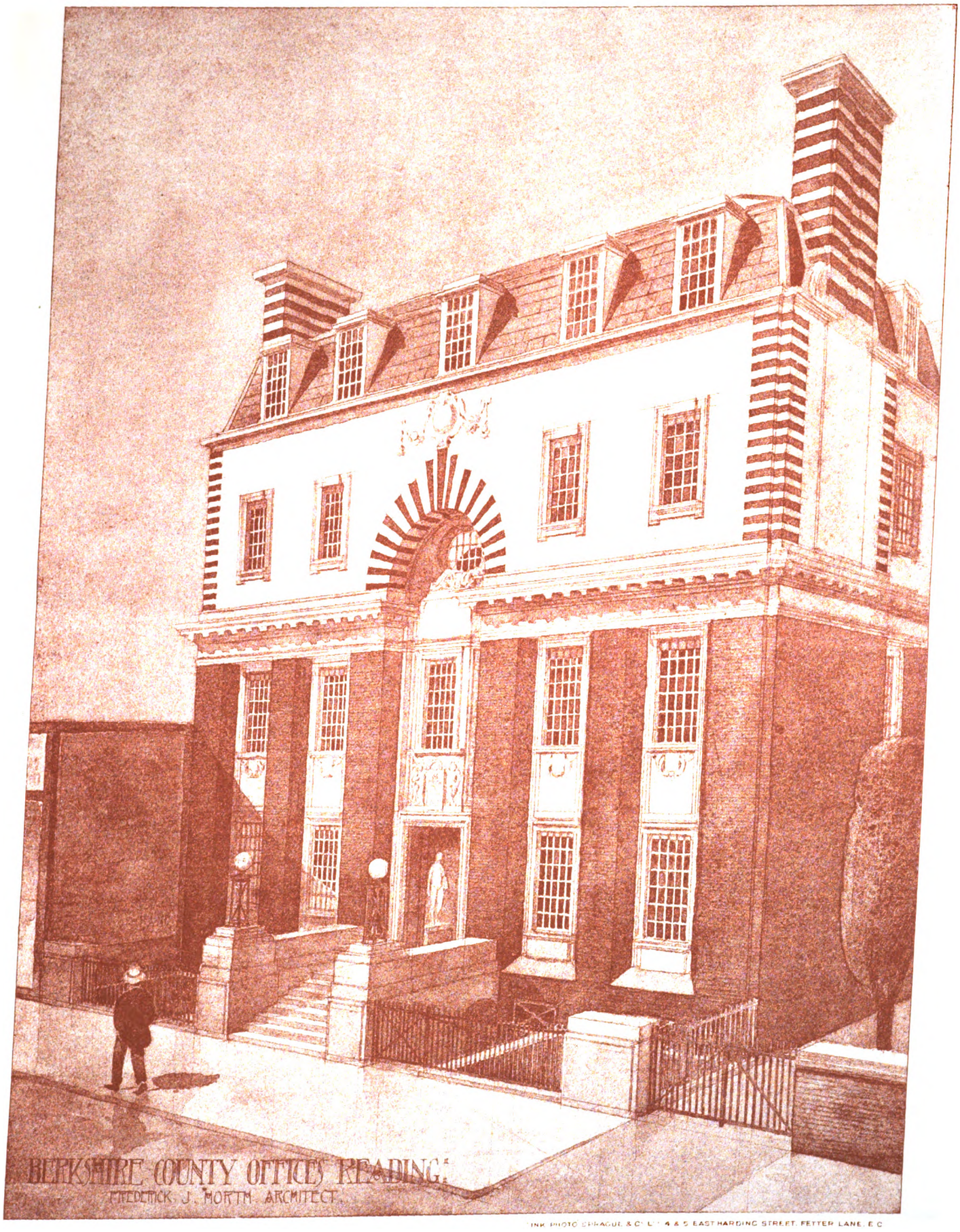
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Royal Academy Exhibition, 1910.

HOSPITAL AT HOUNSLOW

Mr. J. ERNEST FRANCK, A.R.I.B.A., Architect.

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Royal Academy Exhibition, 1910

COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

By Mr FREDERICK J HORTH

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THE CONCRETE INSTITUTE.

BY the courtesy of Mr. William B. Bryan, M.Inst.C.E., Chief Engineer of the Metropolitan Water Board, the members of the Concrete Institute visited the new Chingford Reservoir Works on Wednesday, June 29, when the party were conducted over the works by Mr. Charles F. Marsh, M.Inst.C.E., and Mr. T. C. Deverell, M.Inst.C.E., Resident Engineer.

The Chingford Reservoir will contain about 3,000 million gallons. The water area is 416 acres, and the length of embankment about 4½ miles.

The embankment is being formed of material excavated from within the reservoir.

The top portion of the inner slope will be lined with concrete, and this for a distance of 4 feet below top water will be faced with brickwork. The lining will consist of a brick-faced vertical wall 3 feet high, with concrete coping, which will be rounded off at the bottom to meet the lower portion of the lining which is formed on the slope.

The water will be pumped into the reservoir from the River Lea and River Lea Navigation at the north end through five lines of 48-inch cast-iron pipes passing up the outer slope and discharging into a chamber at the top of the embankment. From this chamber the water will pass over a long granite sill down an inclined slope into a stepped channel.

The outlet from the reservoir will be at the south-east corner. The valve houses on the outlet shafts will be constructed of concrete and have domed roofs. The inner shaft will be connected to the reservoir embankment by a reinforced concrete bridge 6 feet wide between parapets, and 20 feet span. The parapets of this bridge will be reinforced to act as girders supporting the decking.

From the outer shaft the water will pass through a line of 36-inch pipes to a chamber controlled by an automatic valve on the south side of Marsh Lane. From this chamber an outlet channel conducts the water for a distance of about two miles to an existing basin, from whence it can be passed to the other reservoirs of the Metropolitan Water Board's Eastern District and thence to the filter beds at Lea Bridge. From the outer shaft of the reservoir there will be a further line of 36-inch scour pipes discharging into the River Lea diversion.

The construction of the reservoir necessitates several considerable subservient works. The River Lea has been diverted for a distance of three miles through a channel 55 feet wide with side walls of concrete faced with Kentish rag stone and coped with concrete blocks.

Intake channels are also in course of construction from the River Lea and River Lea Navigation to the site of the pumping station at the northern end of the reservoir.

A channel 3½ miles long has been constructed along the eastern side of the works to divert the contaminated water from the hillside, and discharge this below Flander's Weir into the old river channel.

An overflow weir has been constructed to pass flood waters from the Lea Navigation discharging into the old River Lea below the reservoir. The public road crosses this channel on a concrete bridge. The towing-path crosses the overflow weir on a reinforced concrete bridge; it also crosses the weir, supplying water to the pumps from the Lea Navigation by a similar bridge.

The Lea Valley road has been diverted for a length of 1,000 yards, the surface of the diverted portion being of tarmacadam.

The intake channel from the River Lea and the River Lea Diversion is crossed by five reinforced concrete arched bridges, one of which—that carrying the public road over the Lea Diversion—has three spans of 27½ feet with 5 feet rise, and will be on the skew. The other bridges have single spans, one of 50 feet and the other three of 55 feet, the rise in all cases being 5½ feet. The width of the public road bridge will be 40 feet between parapets, and that of the other bridges 12 feet between parapets. One of the 55-feet span bridges is for foot traffic only, being of a different design and only 6 feet wide between parapets.

A meeting of the Concrete Institute was held at the Royal United Service Institution, Whitehall, London, S.W., on June 30, at 8 P.M., Mr. H. D. Searles-Wood, F.R.I.B.A., M.C.I., in the chair.

After Mr. Herbert E. Steinberg, Assoc.M.Inst.C.E., and Major Louis Tebbutt, J.P., had been elected members of the Concrete Institute, Mr. A. Alban H. Scott, M.S.A., M.C.I., read a paper entitled "The British Aluminium Company's Works at Kinlochleven," which was profusely illustrated by lantern slides. The following is an abstract of the paper:—

Aluminium, the author stated, was now obtained electrolytically from bauxite, a clay containing a high percentage of aluminium oxide. The British Aluminium Company were now producing metal containing 97.3 per cent. pure aluminium. They had extensive bauxite mines in France and at Larne. The alumina was extracted from the bauxite at Larne, and from there sent to Foyers and Kinlochleven to be made into the commercial form of metal. The Company had also extensive works at Stangfjord in Norway, Orsieres in Switzerland, and at Greenock, and their rolling mills were situated at Milton in Staffordshire. The total water-power at the various works exceeded 60,000 h.p.

Kinlochleven is situated on the west coast of Argyllshire, and is separated from the county of Inverness by the Loch and River Leven, access being gained to the works by train so far as Ballachulish and Glencoe, thence by steamer up the Loch Leven for a distance of about nine miles, the new village and works being situated, as the name implies, at the top of Loch Leven. This district is one of the most rugged in the Highlands, and is noted for its magnificent scenery. The only road leading into Kinlochleven is from Fort William, a distance of 24 miles, and this road is not available for heavy traffic, nor was it available for use as access to the site during the course of construction of the works.

Kinlochleven works were started early in 1905, and the work was rapidly carried through, an average of about 3,000 men being employed on the works continuously, and during the finer months of the year over 5,000 were engaged upon the work.

The consulting engineers for the dam, hydraulic works, and wharves were Messrs. P. W. & C. S. Meik; for the electrical work, Sir Alexander Kennedy and J. W. Jenkins. The contractors of the dam and hydraulic work were Messrs. Sir John Jackson & Sons; for turbines, &c., Messrs. Jens Orten Boving & Co.; for the generators, Messrs. Dick Kerr & Co.; for the telephones and street lighting, Messrs. Johnson & Phillips; for the switchboard, control panels, and motors for No. 2 Factory, Messrs. Siemens Brothers; for the village, power-house, No. 1 Factory, and staff houses, Messrs. McLaughlin and Harvey; and for No. 2 Factory, Messrs. McAlpine & Sons.

The author of the paper had the honour of being architect for the factory buildings and for the village, staff houses, &c. Mr. W. Murray Morrison, M.Inst.C.E., was the general manager of the Company, under whose direction the whole of the work was carried out.

The systems of reinforced concrete used were Hennebique, Coignet, and expanded metal. The cement used was supplied by the Associated Portland Cement Manufacturers (1900), Ltd.

The dam has been constructed at a distance of about 5½ miles from the head of the loch. By its means the water of three existing lochs was thrown into one.

The top of the dam is 1,068 feet above the sea-level, the level of the three original lochs being 992 feet, 1,022 feet, and 1,028 feet respectively. The catchment area formed by their unification is from 50 to 60 square miles, and as the rainfall is about 100 inches per annum in that part of Scotland, the possibility of a shortage of water, and its harmful consequences, is very remote. This gives the Kinlochleven works an advantage over a great many other hydro-electric stations, which are liable to run dry in summer.

The dam is about three-quarters of a mile long and 86 feet high in the centre, the width at the bottom being 63 feet and the width at the top 10 feet. The whole of the dam is constructed of concrete. The foundations are sunk 5 feet 6 inches into the solid rock. The dam is surmounted by a tower, from which the valves at the outgoing conduit are controlled.

The water is conveyed from the dam along the mountain-side for a distance of about 3¾ miles in a reinforced concrete conduit, the inside section being 8 feet by 8 feet, and the conduit has a steady fall of 1 foot in 1,000 feet. Along the length of the conduit the various side streams from the mountains are picked up so as to take advantage of all the water available; the main penstock chamber is at the junction of the concrete conduit, and the six 39-inch diameter iron pipes form the main pipe line. Here the main control of the water supply is operated.

The pipe line, which is about 1¼ miles in length, conveys the water down to the main distributing valves, which are placed immediately above the entrance of the water to the power-house, the water passing through these valves to the bus-pipes and thence to the distribution pipes (which are below the general level of the floor of the power-house) direct to the nine high-pressure turbines (Pelton wheel type) of over 3,200 h.p. each, and two 930-h.p. turbines. An output of 20,000 k.w. at 250 to 275 v. is secured by means of eighteen

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generators, each capable of running at full load day and night continuously for months at a time, at a normal speed of 300 r.p.m.

The site before any works were commenced was simply in the usual condition of the uninhabited Highlands.

The ground was very varied and treacherous, large tracts of peat overlying portions of the site. The levels also were extremely awkward for arranging the railway, village, and factories on convenient sites, and a very large amount of excavating, not only in soft material, but also in some of the very hardest stone, had to be carried out.

The foundations of the power-house are constructed of ordinary plain concrete, and in these foundations is provided the bus-bar chase, tail-race, and subways for the pipe connections. The floor of the power-house is tiled with red Cheshire tiles and Hawkesley's treads. A powerful electric crane is installed here, so that any part of the machinery can be moved by the crane. The roof is formed of steel trusses, steel and wood purlins, roof-boarding, felted and slated with Ballachulish slates. The main outside walls are constructed of local stone, the dressings being of Kintallen granite and artificial stone made with the local rock.

No. 1 Factory, which contains all the electrical furnaces, is built of similar materials and covers a very extensive floor area. The workshops are arranged along one side of the factory and abut on to and have access from the power-house and furnace-room. The main stores will be built on the south side of the general factory buildings.

The process for manufacturing aluminium requires a great amount of carbon, and in order that a plentiful supply of electrodes may be always to hand, the British Aluminium Company have erected a carbon factory for its manufacture at Kinlochleven. In constructing this building a very treacherous subsoil was come upon, which resulted in part of the foundations having to go about 55 feet below the general floor-level. The whole of the foundations are formed of reinforced concrete on the principle of spread foundation slabs stiffened by cross and longitudinal beams. The columns are carried from the foundation slabs up to the underside of the top beams, these beams carrying the very heavy stone walling; the columns carry the walling and roof, and also in some cases the bunkers and contents. Some of the columns take over 250 tons. The upper reinforced concrete floors are constructed to carry from 8 to 20 cwts. per foot super and concentrated heavy machinery such as motors, &c.

The walls, with the exception of those which are made temporary for the purpose of future extensions, are constructed of coursed random rubble built in cement, the stone being local rock, and the walls vary in thickness from 15 inches to 36 inches, many of them going to a considerable height. The roofs generally have steel trusses of various spans with steel and wood purlins; in some cases the roofs are boarded to receive the Ballachulish slates, and in some of the rooms the slating has been fixed direct on small steel purlins without any woodwork at all. Two large flats are constructed of reinforced concrete, and it is interesting to note that these flats are quite watertight, although no roof covering has been put on.

In this factory overhead reinforced concrete bunkers are constructed to carry 4 tons, 10 tons, 60 tons, 140 tons, 350 tons, and 2,000 tons, the latter being carried on sixteen reinforced concrete columns each 2 feet 3 inches square. The design and work of these are of a very complicated nature, and the author believed the 2,000-ton bin is the largest bunker constructed entirely of reinforced concrete without the aid of R.S.J.'s.

Very extensive roads have been laid out and constructed.

The whole of the factories, streets, houses, cottages, and other buildings are lit by electric light.

The general drainage of the village is carried on with 3-inch to 18-inch diameter stoneware and iron pipes. The surface water has a separate system of large culverts. Septic tanks will deal with the sewage at the outfall, the surface-water outfalls discharging direct into the river. The surface-water culverts are constructed in various ways, some being open with the sides formed of rubble masonry, others being open reinforced concrete culverts, whilst there are also circular and square forms in reinforced concrete.

The water supply for the village is obtained from the catchment area of Corriemora. A comparatively small dam has been constructed, so that the reservoir will contain when completed sufficient water for a population of over 6,000. Iron pipes have been used throughout the whole of the domestic supplies.

The staff houses naturally vary in size and accommodation, but they have generally been constructed with ordinary concrete foundations and 6-inch concrete over the area of the site, the walls being of rough rubble of varying thickness from 15 inches to 22 inches. The walls are in some cases coated with cement rough-cast, and the inside of all external walls battened and lathed and plastered. The interior walls are formed of brickwork in cement, the floors being as usually constructed in the South. The roofs, however, are considerably stronger than usual, and have boarding and felt, and are slated with Ballachulish slates, which are very thick and heavy. These slates give an excellent appearance to the roofs. The slates are fixed in diminishing courses, which again helps the appearance, and this district, having such a little sun, the thick and rugged slates give a greater relief than the thin and even slates. The Ballachulish slates seem to be particularly adaptable and serviceable for that part of the country, as they withstand the very severe weather.

The offices and laboratory are constructed of similar material as the staff houses. In all these buildings the lintels are of reinforced concrete, and the upper floor of the offices is also of this material.

The housing accommodation for the general employés consists of various classes of buildings, which can be generally divided as follows:—

a. Self-contained cottages.
b. Cottage flats.
c. Single men's quarters.

Permanent shops have been erected, including the necessary bakehouses, stores, &c.

The earliest forms of houses were constructed of two half-brick walls from the ground line right up to the eaves with 2¼-inch cavity between, and were rough-cast on the outside and plastered direct on to the brick walls inside.

The lower cottage flats and single men's quarters and administration block are built on quite a new method, the whole of the main constructional work being of reinforced concrete, the walls being formed of reinforced concrete posts and beams, and the panels thus formed by the posts and beams being filled in with two 1½-inch slabs with 2-inch cavity between and the whole face cement rough-casted.

This form of construction had, the author thought, to a very great extent solved the difficulty of obtaining well-built, solid, and efficient houses at such a low cost that it was possible for the lowest paid class of labourer to be housed in a more decent manner with a lower rent than had hitherto been the case.

An electric railway has been constructed from the factory to the wharves at the head of Loch Leven; the total length is about three-quarters of a mile (double track).

The wharf and jetty are constructed of wood and have electrical cranes, both stationary and movable, for quick loading and discharge of steamers.

The largest boat that has used the loch was 1,500 tons displacement, carrying a cargo of nearly 1,000 tons. Until these works were constructed, steamers of only a very small tonnage could use the loch, as at one part, called "The Narrows," it was very shallow even at high water. This, however, has been dredged, thus allowing comparatively large vessels free course.

A discussion followed in which Mr. W. G. Kirkaldy, Assoc.M.Inst.C.E., M.C.I., Mr. T. Malcolm McAlpine, Assoc.Inst.C.E., M.C.I., Mr. H. K. G. Bamber, F.I.C., M.C.I., Mr. G. C. Workman, M.C.I., Mr. Lucien Serraillier, M.C.I., Mr. Percival M. Fraser, A.R.I.B.A., M.C.I., Mr. J. Ernest Franck, A.R.I.B.A., M.C.I., and Mr. H. D. Searles-Wood, F.R.I.B.A., M.C.I., took part.

The meeting then terminated.

GAS HEATING RESEARCH.*

The committee consists of Messrs. John Bond, J. H. Brearley, Charles Wood, in co-operation with Professors Arthur Smithells (Chairman), William A. Bone, Julius B. Cohen, of the University of Leeds, and Mr. E. W. Smith (research chemist).

IN their report of last year the committee recorded a series of experiments on open gas-fires, carried out by Mr. E. W. Smith, with the object of obtaining a heat-balance with as much accuracy as possible, and especially with the object of determining the output of radiant heat.

On resuming the experimental work, Mr. Smith first addressed himself to improving the apparatus used for

* Abstract from second report of the "Gas Heating Research Committee" appointed by the Institution of Gas Engineers in conjunction with the University of Leeds.

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measuring radiation, and then proceeded to study a considerable variety of stoves kindly supplied by different makers.

Experiments were made upon the relation of gas consumption to radiation efficiency. Another series of experiments was made on the relation of composition of "fuels" to radiation efficiency. Determinations were made of the radiating power of naked flames. Finally, experiments were made on condensing stoves. The results of these experiments are recorded in the report.

The Determination of the Efficiencies of Various Makes and Types of Stoves.

With a view to making an examination into the principles underlying the efficient working of the open gas-fire a number of makers were invited to lend certain of their stoves to the committee, and these were each put through a series of tests and their results compared. The working of the stoves themselves was also varied until the greatest efficiency was attained. In one or two instances it was found that stoves, after being adjusted to suit the conditions under which they were tested, gave 4 or 5 per cent. better efficiency than when used as they were forwarded from the makers. It is always expected by the makers that stoves will be adjusted afresh after installation, but this is frequently neglected.

In the following table there are given detailed results of the experiments on the various types of stove. Where flue heat loss is recorded, it is the result of a separate experiment. During the radiation determinations, the temperature of the room was quite normal, ranging from 15° to 18° C., but during the flue heat loss experiments, the door of the room was closed, and this accounted for the high temperatures shown in column L.

TABLE 1.

—	Description of Experiment.	Size of Radiating Surface.	Number of Flames in each Burner.	Barometric Pressure in Inches of Mercury.	Pressure of Gas at the Meter in Inches of Water.	Gas Rate in Cubic Feet per Hour at 60° F. 30 Inches of Mercury, Wet.	Net Calorific Value of One Cubic Foot of Gas at 60° F. 30 Inches of Mercury, Wet.	Total Calories per Hour.	Percentage of Heat Radiated.	Percentage of Direct Convected Heat.	Percentage of Heat Lost to the Room and Passing up the Flue.	Temperature of the Room Air.	Temperature of the Outside Air.	Temperature of the Flue Air.	Rise in Temperature of the Flue Air.
	A.	B.	C.	D.	E.	F.	G.	H.	I.	J.	K.	L.	M.	N.	O.
		Inches.						(F × G.)		100—(I+K.)		°C.	°C.	°C.	°C.
1	Open gas fires, with fire-clay fuels	9× 7	7	30.07	1.44	19.14	136.2	2,608	36.9	37.7	25.4	23.7	7.9	89.0	65.3
2		9× 7	7	29.94	1.5	19.11	140.6	2,687	37.36	—	—	—	—	—	—
3		9× 9.5	7	29.50	1.34	20.44	127.9	2,613	40.0	18.33	41.67	33.0	11.0	88.0	55.0
4	Do., with duplex burner	8× 9.5	7	29.61	1.12	16.78	136.1	2,450	37.73	23.60	38.67	32.0	11.7	96.0	64.0
5		8× 9.5	7	29.22	1.39	19.24	128.3	2,467	41.82	—	—	—	—	—	—
6		4× 9.5	3	29.28	1.12	9.62	137.4	1,321	36.93	26.57	36.50	27.5	13.0	64.0	36.5
7	Open gas fires, with fire-clay fuels	13× 6.5	8	29.13	3.21	30.96	136.7	4,230	42.85	37.15	20.0	28.0	14.3	68.0	40.0
8	Horizontal iron-fret Stoves	7× 9.5	4	29.97	1.44	21.13	137.3	2,899	41.06	—	—	—	—	—	—
9		8×10	4	29.88	1.44	25.99	139.8	3,637	35.0	35.05	29.5	34.0	12.3	116.0	82.0
10	Vertical iron-fret	10×12.5	11	29.68	1.01	29.12	139.0	4,043	42.06	46.85	11.09	47.0	17.0	124.0	77.0
11	Reflector stove	12 inches	14	29.62	1.5	19.96	135.2	2,699	26.06	—	—	—	—	—	—
12	Fire-clay fuels	9× 4.25	10	29.08	.8	16.64	137.0	2,277	40.00	29.88	30.12	33.0	—	100.0	67.0
13	The same stove as used in Experiment 3, but with varying forms of "fuels"	9× 9.5	7	29.92	1.23	22.87	134.8	3,081	40.57	—	—	—	—	—	—
13A		9× 9.5	7	29.67	2.41	23.93	128.6	3,077	38.99	—	—	—	—	—	—
14		,,	7	30.01	1.34	21.45	132.5	2,841	42.85	—	—	—	—	—	—
15		,,	7	29.90	1.34	21.31	134.2	2,859	44.73	—	—	—	—	—	—
16	The same stove as used in Experiment 7, but with varying composition of "fuels"	13× 6.5	8	29.11	3.48	32.51	134.9	4,381	45.86	—	—	—	—	—	—
17		,,	8	29.93	2.89	27.13	137.6	3,734	44.02	—	—	—	—	—	—
18		,,	8	29.82	2.99	27.17	137.7	3,741	48.5	—	—	—	—	—	—

By reference to Table 1, most of the details of the various stoves will be found, but a short paragraph describing each stove more fully, and also giving a few notes on the stove as a whole, will no doubt add to the value of the experiments.

Experiment No. 1.—In construction this stove is of very plain design. The "fuels" are columnar, 7 inches high and slightly wider up their centre than most other fuels. They are almost cylindrical and regular in shape. This stove would have given a large percentage radiation if either the fuel had been narrower or the flames wider. The gas and air adjustment was good and convenient; but the flames were uneven in size. The amount of heat passing up the flue was very low, as arrangements were made in the top and back of the stove for taking much of the heat from the waste products without diverting them down the back of the stove. The fuel guard was replaced by a single bar of iron. In all experiments the gas and air were adjusted to give a flame showing an indistinct inner cone.

Experiment No. 2.—This was made under conditions almost identical with those of experiment No. 1, the only difference being a higher calorific value of the gas. It will be seen that this is increased by about 3 per cent. If 30 to 40 per cent. of this increase in heat evolved be radiated, the total percentage of heat radiated will be increased by about 1 per cent. This is approximately the case within the experimental errors of the determinations. A rise in calorific value has caused a rise in the amount of heat radiated, the size of the flame remaining the same.

Experiment No. 3.—This stove was from a different maker. The "fuels" were longer and not so regular as those used in experiments Nos. 1 and 2. They were also less in diameter. The fire-brick back was of good construction and increased the radiation efficiency. No attempt appeared to have been made in the construction of the top of the stove to abstract heat from the waste hot products. This accounts for the high flue loss. The perforated iron casting directly above the burner prevented a large volume of cold air being pulled up through the fuels with the flames. This is a point sometimes overlooked. The gas and air adjustments were convenient and satisfactory. No fuel guard was used.

Experiments Nos. 4, 5, and 6 were made with a stove having a convex front of fuel. It was fitted with a duplex burner and an iron fuel guard. Experiments Nos. 4 and 5 were similar in every respect, except that it will be seen that in No. 5 the increased size of flame, owing to a greater gas consumption, increased the radiation efficiency of the stove—although there was no corresponding increase in the numbers of calories being produced per hour. The stove was by the same maker as those used in experiments Nos. 1 and 2. The special significance of the tests with the duplex burner is explained in another part of the report.

Experiment No. 7.—This is another maker's stove. The fuels were much shallower than is usual and extremely irregular on the inner side. The construction of the fire-brick back added much to the value of the stove as a radiating appliance, the composition and conformation of the material intercepting and retaining heat that would otherwise have been convected. The construction of the body of the stove was such that the waste products were deprived of a larger amount of their heat than is usually the case. This stove had a sheet-iron back attached to it, and there were holes in the top of the stove from which much heat was convected. The gas and air adjustments were simple, adequate, and convenient.

Owing to the construction of the "fuels," slight changes in the position of the burner, or of the fuels themselves, would reduce the radiation efficiency 4 or 5 per cent. There was an iron grating in front of the "fuel." The width of this fire is greater than that of any other fire dealt with in this report. It will be noticed that the radiation efficiency of this stove is slightly higher than that of other stoves of a similar type. It may be taken that wide fires of a given type give higher radiation efficiencies than the narrower ones. The mean temperature of the fire is increased, and although this increase be small, the increased amount of radiation is proportionately greater.

(To be continued.)

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THE DECAY OF STONE ANTIQUITIES.*

THE antiquities in the Museum Gardens have during the last few years shown serious signs of decay. In this they are not singular; the Houses of Parliament, York Minster, and many, perhaps most, stone buildings in towns are more or less affected, so that the question is of almost national importance.

The cause has been put down to smoke, sulphuric acid from burning coal, and other causes; waterglass, limewash, baryta water, and many other applications have been tried without any success, and the disease still spreads. Our stone is a magnesian limestone. Some years ago objects in the lower storey of the Hospitium first began to be attacked. Our Council, acting on expert advice, decided that more air was required, and a grating was applied to the doorway so that the door could be kept open, but no benefit has resulted. At present the cry is that the cause is wind action, and windows have been put into parts of St. Leonard's Hospital. These two views cannot both be right. The inside also of St. Leonard's Hospital, on the best expert advice, was washed over with limewash about three years ago, but it has all peeled off, and the entire inside surface, instead of being a mellow brown, is now one mass of whitish crumbling dust.

It so happens that years before this idea of wind action was introduced here I had paid considerable attention to the question of wind erosion, and had taken photographs of such examples as I met with in the deserts of Iceland. The best specimen was a surface of soft tuff or consolidated volcanic ash with larger fragments of harder stone embedded in it. The hard, sharp sand, driven by the strong wind, had eaten away the soft tuff, leaving the harder blocks standing up, and the prevailing wind having come from one direction the lee side of the stones had escaped, and a tail remained behind each of them. The action was entirely a surface one, and the stone that remained was sound and uninjured; no crumbling was noticed.

I saw some very striking examples of wind action on the new ash of the 1906 eruption of Vesuvius. The old lavas near the Observatory were covered with a layer a few feet thick. It had fallen gently and was in well-defined layers of slightly different appearance and from half an inch, or even less, to a few inches thick. When I was there a few days after the eruption the deposit was rapidly consolidating. The wind carried the loose sand forcibly with it, and was planing off the projecting parts, exposing beautiful sections of the different layers. It was entirely a surface action. The parts which remained were entirely untouched and unaltered. I have seen the same thing on Haleakalá, the great dormant volcano in the Hawaian Islands.

In July 1902 I saw, at quarters too close to be pleasant, along with Dr. Flett, the descent of one of the incandescent avalanches similar to the one that destroyed St. Pierre, in Martinique, and brought forward the theory of the hot blast, which at first met with much opposition but is now generally accepted. Briefly, it is believed that the hot lava or magma, rising in the chimney of the volcano, is highly charged with gases and vapours which are retained in solution by the pressure. When it gets vent and the pressure is relieved the whole is blown to pieces by expansion of the gases, and the result is a mixture of incandescent fragments, minute or larger, suspended in a mixture of gases and vapours, also incandescent, which rolls down the mountain side by the force of gravity with the weight of a fluid and the mobility of a gas.

In 1907 I revisited Martinique, and walked a considerable distance up the valley down which the avalanche descended. I saw the rocks grooved and scratched by the avalanches and hot blast which had repeatedly passed over them. The grooving thus produced, which much resembles glacial scratchings, is figured in Part II. of the Report to the Royal Society, published in the *Phil. Trans.* for 1908. It is entirely a surface action, and the rock beneath is not decayed or crumbling, and it is in all respects different to the crumbling of our antiquities.

A few weeks ago Professor Boyd Dawkins, without knowing anything about our decay, pointed out to me that one of the boulders of Shap Fell granite in the gardens of the York Museum showed large projecting crystals of felspar. Now the felspar is harder than some other components of the granite, but at the same time more readily decomposed by atmospheric agencies. He inferred that the softer parts had been removed not by decomposition or weathering, but by sand carried by strong winds, and the harder felspars had remained prominent. The boulder had not altered in appearance since it was dug out of the boulder clay at the railway station, so he concluded that the erosion had taken place before its long journey by ice, which led to interesting speculations as to the climate of the Glacial period. Two other Shap boulders in the gardens show similar surfaces; others are smoothed, scored and grooved in the usual manner where they had been rubbed against the rocks.

Now the disease from which our stones are suffering is not a generalised surface abrasion like the above. It is as strictly localised and circumscribed as a ringworm, which is well known as a parasitic disease, the part outside the border being absolutely free and unabraded, while the part inside is depressed, and the whole floor of the cavity is formed of a crumbling mass of grit. It would be impossible to find anything more different from the examples of wind action described above. It is not a surface action at all, but, I believe, a decay or rot affecting the substance of the stone, and, like other decays and rots, is in every probability caused by the action of some low organism like the moulds and fungi which are known to rot wood, canvas and other vegetable materials.

About two years ago, to test this view and endeavour to find a cure, as all efforts based on the abrasion or chemical theories had failed, I had affected stones treated with various germicides, and the two stones which have since best resisted the decay were two then treated with sulphate of copper (5 per cent. solution) and bichloride of mercury.

It will be remembered that copper sheathing and copper nails are used to prevent the decay of the bottoms of wooden ships, and sulphate of copper is the preservative used in the manufacture of the well-known Willesden rot-proof canvas. It is also a very powerful germicide, and would be more commonly used in ophthalmia and other bacterial eye diseases were it not that it causes severe smarting.

Bichloride of mercury is much used as a germicide in surgery.

I showed Professor Dawkins our ruins and the trial stones, and he said that it seemed like the localised action of some acid, and agreed that it was quite possible that some low organism might secrete acid or other material capable of disintegrating the stone, though this was the first suggestion of this cause he had heard, and finished by saying that this was, he thought, the most likely source of the acid. The town dirt and other impurities might form a nidus in which it could develop, and the damp to which all outdoor stones are necessarily exposed, and which in the case of the Hospitium has never properly dried out since the great flood of 1892, would doubtless contribute. Most low organisms cannot grow if deprived of moisture.

I then asked Mr. Ryan, F.I.C., the chemist to the waterworks, to do me a cultivation of a little of the dust in the same way as in water analysis. He did so, and he produced a plate cultivation with thousands of colonies.

(Three tubes of such cultivation were exhibited, and the writer asked assistance from any botanists or bacteriologists present in identifying them.)

The next step will be to apply some of these cultivations to a piece of healthy stone and see if the disease can be inoculated. Meanwhile, I strongly advise the application of sulphate of copper to a larger piece, and that means be applied to the Hospitium to keep it perfectly dry, such as a stove inside and an embankment and valve to keep out the floods which happen every few years, and one of which has not recently occurred.

After the reading of the paper, Mr. E. M. Holmes, of the Pharmaceutical Society, London, mentioned the names of two lichens which secreted oxalic acid, which caused pitting of the stones on which they grew, and said this was probably something of a similar nature. He recommended that after the stone had been sterilised it should be treated with a varnish composed of shellac and copal dissolved in paraffin, which would keep out further germs and spores, and the paraffin was also a good germicide and very penetrating. He pointed out that bamboos, some grasses, equisetums, diatoms among vegetables, and sponges among low animals all deposited silica in their tissues, so that there must be some chemico-vital process by which that refractory substance could be dissolved.

Dr. Bather, F.R.S., of the British Museum of Natural History, was inclined to accept the bacillus theory, for they were learning daily how largely microbes entered into processes which they previously believed were purely physical, as in the case of the production of nitrates in South America, which they now knew were due to the work of germs. If this decay was due to organic agency they would find sulphate of copper very destructive of the agent.

* A paper read on July 6 before the Museums Association York Meeting by Dr. Tempest Anderson, D.Sc.

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On the other hand, Mr. H. M. Platnauer (York) was unable to accept the bacillus theory, and deprecated any comparison between the decay of stone and wood, for whereas one was purely mineral, the other was almost entirely organic. The principal disintegrating forces at work in York were the carbonic and sulphurous acids in the atmosphere. The smoke contained a large amount of sulphurous hydrates, and in the moisture, which unfortunately was ever present in the York atmosphere, it attacked the alkaline carbonates of their stones. There was absolutely no precedent for a belief in a bacillus which lived on sulphate of lime.

After further discussion, Dr. Tempest Anderson replied to the queries, and answering the question why this bacillus should only have developed an appetite for stone during the last twenty years, the period in which the erosion was most marked, said that probably that period synchronised with the coming of that particular bacillus, as instances were frequent of the operations of particular germs commencing at a definite time.

INTELLIGENT FIRE-FIGHTING.

AN admirable suggestion comes from Canada of which architects in the Mother Country could help forward the adoption here. It is already the practice amongst good architects to supply their clients on the completion of a building with plans of the drains, water, and gas pipes, &c., so that when repairs or alterations are required the intelligent British workman may find his way about without an undue amount of cutting away and breaking open in exploration.

The *Montreal Daily Witness* suggests "that there be created a card index which, with simple and conventional diagram and signs, would indicate at a glance the nature of a building and its contents, and particularly the location of dangerous features, such as excessive weights on upper floors, explosives, or basements from which there are no exits, and so forth, and that would indicate the position of stairs, elevators, fire escapes, and other exits, that would show the precise position of the main gas cock and electric light switch so that these might be immediately shut off on the arrival of the firemen, thus preventing adding fuel to the fire or endangering those in the building by asphyxiation through the escape of gas, and preventing electrical short circuits and the danger to those in the building of electrocution through damaged electric wires. The diagram or chart would also show in simple way the position of machinery or valuable stock, in the first instance for the guidance of the salvage department, and also that the chief may know in what part of the building there is most treasure. The diagram might also show in conventional fashion the kind of roof, the nature of the walls, showing also any internal unprotected connection with adjoining buildings. Figures at the upper right hand corner of each flat would indicate the number of employees belonging to such flat, and immediately under them other figures would indicate the value and approximate weight of the contents of that flat. Light machinery might be indicated by a series of light crosses, heavy machinery by heavy crosses, and the underscoring of anything emphasising that it was, comparatively speaking, of special value. The letters 'VS' might show the location of particularly valuable stock, and a circle with a heavy 'T' in it the position of treasure, not only such as specie and jewellery, but such, for instance, as special dies and tools which are sometimes as valuable if not more so than jewellery itself. Any explosive material might be indicated by a sun with an 'X' in the centre, while a dangerous weight on an upper floor would be indicated by a black block. The position of sprinkler valves would, of course, also be shown to advantage, so that the sprinklers might be stopped as soon as a fire is extinguished."

Already in some of our large hotels, such as the Carlton, there are plans on every floor showing to visitors the nearest way to safety exits and the position of hydrants and first-aid fire-fighting appliances, and the adoption of the suggestion of the *Montreal Daily Witness* would be a further step in the right direction, and assist the firemen in a quicker and more intelligent attack on a conflagration in its early stages—the essence of success in fire-fighting and the means of saving life and property.

Readily grasped information as to the construction and contents of a building would not only be of value to the fire brigade in revealing the dangers to be met, and the best method of subduing the fire, but would be particularly valuable to the Salvage Corps, who would have before them the location of the property most needing their care, instead of having to find it out, hampered as they now are by smoke and water as well as fire.

In our contemporary's proposal "it is suggested that there be four copies made of the card for each building, one to be placed conspicuously near the main entrance, one to be sent to the fire department, one to the building inspector, and one to the factory inspector; that before the card finds itself placed in the index of the fire chief his inspector will make a visit to the building and see that the card has been properly prepared, that explosives are placed within easy access of door or window so that they may be quickly removed from a burning building, and that dangerous weights will, where feasible, be carried by additional supports. The building and factory inspectors will also visé their copies of the card, and the facts therein given may lead to a more particular inspection of the building if there is evidence of overloading or liability to excessive vibration from the machinery it contains. It is further suggested that this index be revised at least every six months and at other times when there are considerable alterations in the building or in the disposition or weight of its contents. The placing of the plan at the main entrance in a little glazed frame, with the date of its preparation upon it, would render it open to the inspection of the police force, who would report any delinquency in the semi-annual renewal of the plan; it would also be open to complaints from employés who felt the facts were not correctly shown, and last but not least would be accessible on the arrival of the brigade. The home of the fire department's card index, however, might very well be in drawers in the vehicles of the district captains, so that when the captain arrived at a fire and while his men were raising ladders and connecting hose to the hydrants, he would have thirty seconds in which to pick out and survey the card in case he did not find it at the entrance of the burning building. As the face of these cards would have simply the diagram with its conventional signs as regulated by the department, and marginal notes of the simplest, he would get all the main facts at a moment's glance. On the back of the card there would be printed a form to be filled up, which would contain all other information that he might be anxious to know, such, for instance, as the position of the nearest hydrants, whether the water tank has independent supports or otherwise, whether the hoist has fireproof walls and doors, and other matters that he might be most anxious to know about. This information on the back of the card would be always in the same order, the cards being provided by the fire department, with a sheet of instructions for their proper preparation. Very large buildings might require large cards folded, however, to the adopted index size. Fire chiefs would become so intimate with such a card that they would read its contents almost as quickly as they would the face of an ordinary playing card. With such information before him, a fire chief could marshal his men to the best advantage in their fight with the flames and in their salvage of life and property, and at the same time could avoid the accidents which so often befall firemen in the exercise of their duties through the falling of heavy weights from upper floors, by asphyxiation by gas, by explosion, or by electrocution."

In the *Montreal Daily Witness* a model of the proposed card index is given. This is a simple diagram in oblique projection, with marginal notes as to the position of heavy weights, stairs, doors, valuables, gas cock and main electric switch, water tank, &c., and with marginal explanatory notes. We think an isometric diagram would be clearer, and the great point to be aimed at is clearness and easy comprehension, hence any architects who may adopt the suggestion, and we hope they will be many, must at all costs avoid over elaboration of the diagram.

THE LAW ABOUT ARCHITECTS' FEES.

IN the King's Bench Division on Saturday, July 16, Mr. Justice A. T. Lawrence had before him for further consideration an action for architects' fees in connection with the building of a new Kursaal, which was brought by Mr. F. W. Ackland Hodge, a London architect, against the Matlock Bath Urban District Council. At the former hearing by his lordship and a special jury at the Derbyshire Assizes the jury found that the plaintiff's dismissal by defendants was wrongful, and the defendants had the benefit of the work and skill of the plaintiff. In addition they found that if plaintiff were entitled to remuneration in respect of his own work as distinct from that of Mr. Nuttall (the joint architect), the amount was to be 230*l.*; that if he were to be remunerated in respect of the work of Nuttall and himself down to the time

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MODERN EUROPEAN ARCHITECTURE.
FRANCE.



[From *La Construction Moderne.*

OFFICES OF THE MINISTRY OF MARINE, PARIS.—M. PATOUILLARD-DEMORIANE, Architect.

of plaintiff's dismissal, the amount should be 260*l.*; and that if Hodges's dismissal was a breach of a binding agreement he should get 280*l.*

On these proceedings Mr. Shearman, K.C., submitted that the plaintiff was entitled to judgment with costs for 260*l.*, or alternatively to 230*l.*

Mr. Hugo Young, K.C., on behalf of the defendant Corporation, argued that plaintiff was not entitled to judgment at all. Counsel submitted that the seal of the Corporation was required for all contracts for work which it was not necessary and obligatory upon the Corporation to do in order to carry out the purpose for which the Corporation was created. Nobody could say that the building of a Kursaal was such a work. Mr. Young argued that according to the decided cases "getting the benefit" from plans meant that the building had been erected, and that the inhabitants had the use of them. Here the appointment of the joint architects was "in connection with the erection of the Kursaal." The contract therefore was a contract to erect. Had the Kursaal been erected? If not, nothing could be recovered under quantum meruit (1) because prima facie such a contract was a contract for which a seal was required; (2) because the inhabitants not having had the benefit which was to result from the contract being entered into, the case was not such an exceptional case as would enable money to be recovered on it in the absence of a seal. The question of rescission of contract did not arise. The question was not whether the defendant prevented the fulfilment of the contract, but whether in fact the erection had taken place. The moment you found that the erection had not taken place this contract could not be sued upon.

The Judge: You mean "getting the benefit" is the performance of the contract?

Mr. Hugo Young: Certainly. We have not got the Kursaal.

The Judge: If that is right I can enter into a contract for 1,000*l.*, and receiving 900*l.* say I have not got the benefit of the contract.

Mr. Hugo Young: No, my lord. If you get 900*l.* the contract is fully executed to that extent.

The Judge: So was this up to the time it was discontinued.

Mr. Hugo Young argued against this view, and suggested that judgment should be entered for the defendants.

Mr. Shearman, K.C., in his reply said that as the contract was not under seal he thought it would be safer merely to ask only for the 230*l.* His submission was that once it was shown that such services had been rendered and accepted by a Corporation that was equivalent to showing that it was possible to sue on a quantum meruit, and that the Corporation were just as responsible as a private person would be, subject to the exception that if the alleged implied contract were ultra vires it was not binding.

Mr. Justice Lawrence, in giving judgment for the plaintiff for 230*l.*, said Mr. Hodge could not recover damages for dismissal, and he could not sue on the contract. Could he sue for the 230*l.* to which the jury said he was entitled on the ground that the population of this district had benefited from his work? His lordship thought that as the contract was not ultra vires the Corporation could not by reason of an informality take the benefit of services rendered at their request, and then refuse to pay for them. That seemed to be the view of the law that had at last prevailed, and it was consonant with justice. The purpose for which this contract was entered into was a purpose necessary for carrying out the powers with which the Corporation was clothed. The Corporation had received benefit from the services rendered by the plaintiff, and if the view of the jury was right would long continue to enjoy that benefit. There would accordingly be judgment for the plaintiff for 230*l.*

A stay of execution was granted upon terms.

NOTES ON BOOKS.

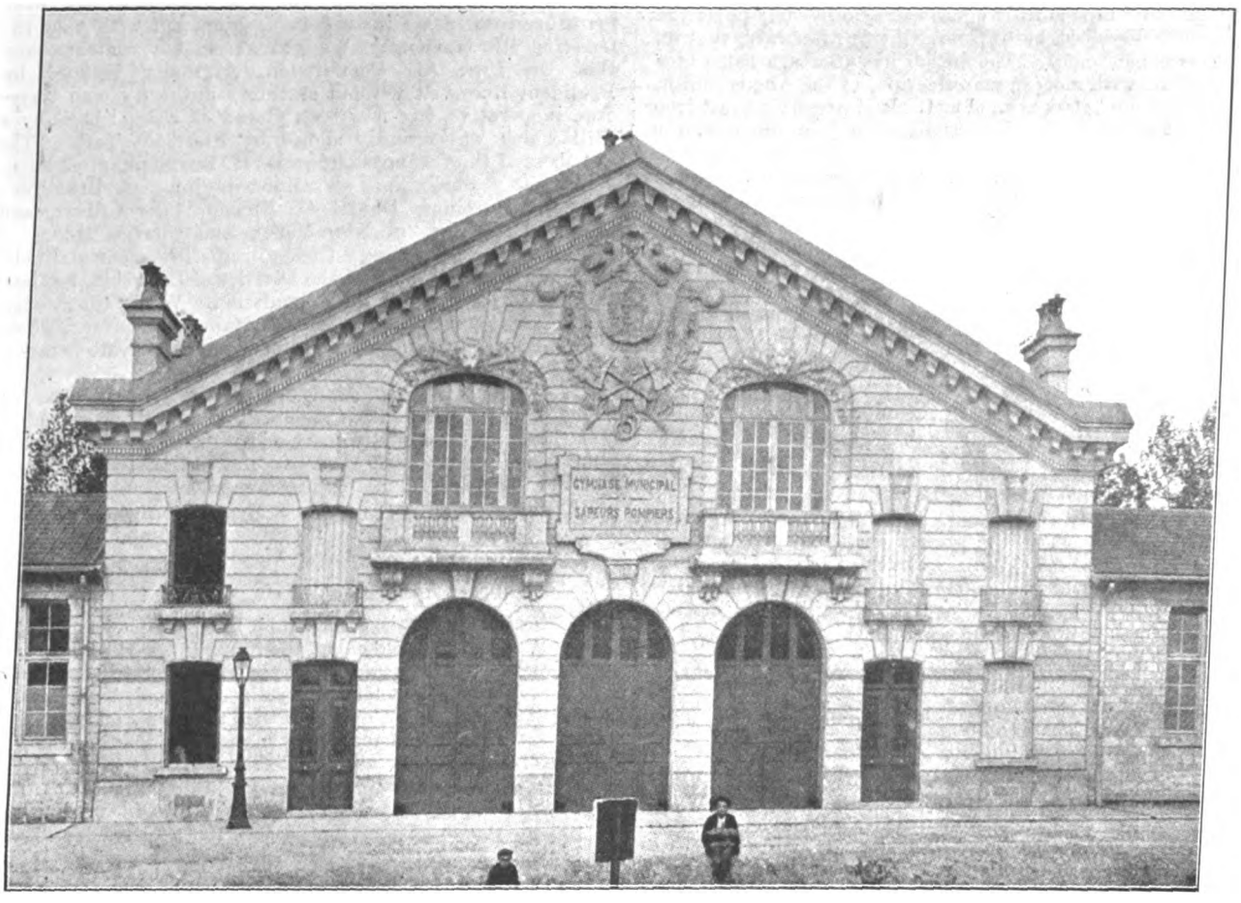
"A History of Gardening in England." By the Hon. Mrs. Evelyn Cecil (the Hon. Alicia Amherst), Citizen and Gardener of London. Third and enlarged edition, with illustrations. (London: John Murray. 12*s.* net.)

IN the third edition of her standard work on the history of gardening in England Mrs. Cecil has added a few facts from original authorities to further illustrate each period, such as notes from the MSS. records of Westminster Abbey, from those of the Gardeners' Company, or of Humphry Repton

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MODERN EUROPEAN ARCHITECTURE.

FRANCE.



[From *La Construction Moderne.*

FIRE BRIGADE STATION AND MUNICIPAL GYMNASIUM, SAINT-OUEN.—M. MANCEL, Architect.

at a still later date, but the most important additions are with regard to the work of Le Nôtre in this country. The chapter dealing with the nineteenth century has also been almost entirely rewritten.

The history of English gardening is traced from its earliest times, commencing, save for presumptive Roman instances, with the early monastic gardens, then those of the thirteenth, fourteenth, and fifteenth centuries, not only of the monks but of royalty, nobility, and gentry. With the Tudors and the Stuarts comes a further development of gardening, or at any rate more copious records of the art. Although the eighteenth century and the latter part of the seventeenth century saw a great extension and elaboration of the garden, it is worthy of notice that the idea of formal gardening was then by no means new, but existed in mediæval times, and it was not until the latter half of the eighteenth century that "landscape gardening" had any recognition. This revulsion from the general practice of older days was no doubt in part assisted by the admiration for Chinese, and possibly also Japanese, gardening, which Sir William Chambers and others of his time fostered in England.

It is remarkable that the rage for "landscape gardening" should be contemporaneous with the most formal period of architecture that has ever existed in this country. Chambers, Kent, "Capability" Brown, and Repton were the high priests of the new cult that was responsible for the destruction of many of the fine examples of formal gardening that belonged to wealthy owners, and it is, no doubt, due only to the comparative poverty of smaller manor lords that we owe the present existence of many examples of the earlier type of garden that still remain.

The feature of nineteenth-century and modern gardening has been the multiplication of varieties of plants, both by the introduction of exotics and the modification of indigenous or perfectly acclimatised types and instances.

Mrs. Cecil's book is, as it purports to be, essentially historical, and hence deals with periods and the characteristic treatment of gardens attaching thereto, the varieties of plants that were in vogue, and the manner of their disposition, rather than descriptions of particular gardens. Hence although instances are quoted in illustration of the historical aspect, reference to any particular example of a garden requires the constant use of the very good index included, but to the architect of garden or house, and to all who would know what manner of garden is most in accord with the manners and customs of any particular time the scheme of the book and its fulfilment are invaluable.

Not the least useful feature to the genuine student of gardening from the historical point of view is the complete bibliography of the subject and the continual reference to cited authorities.

"Technischer Führer durch Wien. Herausgegeben von Oesterreichischen Ingenieur- und Architekten-Verein." Redigiert von Ing. Dr. Martin Paul, Stadtbauinspektor. (Vienna: Gerlach & Wiedling. 17*s.*)

It is many years now since the first issue of the *Technischer Führer durch Wien* appeared—at the time of the great international exhibition at Vienna in 1873—but the value of the handbook to engineers and architects visiting the capital of Austria has been constant, and we are glad to see this year a new edition brought up to date. The scheme of the book is similar to that of the earlier work, but Vienna has not stood still since the great monumental buildings were erected on the site of the ancient fortifications, and many notable edifices have been erected. The present handbook is an indispensable necessity to any architect visiting Vienna, as it gives descriptions, fully illustrated, not only of the most notable modern buildings, but also of old Viennese architecture, particularly of the later Renaissance or "Barock" style, of which there are so many admirable examples.

"Domestic Sanitation and Plumbing." By A. Herring-Shaw, R.P.C. Part I. (London: Gurney & Jackson. 6*s.* 6*d.* net.)

Part I. of Mr. Herring-Shaw's work deals with the materials used in sanitary engineering, the removal of waste matter from buildings, sanitary fittings, &c. As we commence to read this book we form the opinion that the author's knowledge is neither practical nor up-to-date. His descrip-

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tion of Portland cement is innocent of the British Standard specification. In his first description of piping we find mention of tinned lead and tin-lined lead, but not of tin-lined iron pipe. But as we proceed we gain a different impression. The "health" pipe is fully described. So in early pages the rust joint is described, but it is not till long afterwards that its weakness is mentioned. The author has an exaggerated idea of the value, with modern manufacture, of the Angus Smith, Bower Barff, and glass-enamel methods of preserving cast-iron pipes. His sketch of a lead and gaskin joint for cast-iron pipes is incorrect as carried out by a skilled workman, who so proportions his gaskin and lead that the whole of the former is burnt at the moment the latter solidifies. In his account of fittings and their modern use the author is satisfactory and up-to-date, and he does well, we think, to describe and illustrate obsolete and insanitary devices, such as D traps and pan closets. The description of drain laying does not deal with the best devices for properly making the joints. With much that is excellent, it is a pity that the completeness of the work should be marred by minor defects.

"Country Life." Vol. xxvi. (London: "Country Life," George Newnes, Ltd.)

This half-yearly volume shows that *Country Life* still maintains its value to the student and admirer of architecture by its excellent illustrations of country homes and gardens, old and new, which in the present instance include Adcote, Shropshire; Breccles Hall, Norfolk; Brereton Hall, Cheshire; Buckden Old Palace, Huntingdonshire; Combe Abbey, Warwickshire; Erddig Park, Denbighshire; Forde Abbey, Dorsetshire; Hall Barn, Buckinghamshire; Hartham Park, Wiltshire; Home Place, Holt; Hursley Park, Hampshire; Little Thakeham, Sussex; Lyddington Bede House, Rutlandshire; Moyles Court, Hampshire; Rotherfield Hall, Sussex; Rushton Hall, Northamptonshire; Stoke Edith, Herefordshire; Swakeleys, Middlesex; Thame Park, Oxfordshire. Other items of architectural interest are an illustrated account of Amboise, as an example of the Châteaux of France; Notes on the art of Treillage; and short articles on Tudor panels from Waltham; on Church Bells; on Langley Church and Pew; and on some surviving Gothic knockers.

COMPETITIONS.

DUBLIN.—The Kingstown Urban District Council offer first and second prizes of 50*l.* and 20*l.* respectively for the best set of plans for the new Carnegie Library to be erected at Lower George's Street, Kingstown. Plans of the site, together with conditions of the competition, can be obtained upon application to Mr. J. Sherlock Vaughan, Town Clerk. One guinea will be charged for each set. This sum will be returned on receipt of a set of plans, or on return of the conditions and block plan. Plans, &c., should be delivered at the Town Hall not later than 10 A.M. on September 1.

MIDDLESEX.—Estates situated at Ruislip and Northwood, the property of King's College, Cambridge, are about to be developed as a garden city. The extent of the estate is 1,300 acres. A public town-planning competition has been arranged, and Sir Aston Webb and Mr. Raymond Unwin appointed assessors. A temporary office has been taken at 33 Henrietta Street, London, W.C.

PAISLEY.—The Paisley School Board, in committee, have unanimously agreed to recommend the acceptance of the decision of the assessor in connection with the plans submitted by architects for the new school for defective children, which is to be erected in Renfrew Road, Paisley. In his award the assessor has placed the plans of Messrs. Craig-Barr & Cook, Paisley, first, and those of Mr. T. Graham Abercrombie and Mr. Charles Davidson, also of Paisley, second and third respectively. It is estimated that the new school will cost 9,500*l.*

PLANS for a garden city on the west side of Newport have been passed by the Newport works committee. The site is on the elevated ground near Preston Avenue and Fields Park Road. Viscount Tredegar is the landowner, and the plans were prepared at the Tredegar estate offices.

THE North British Academy of Arts (Newcastle-on-Tyne) will hold the third exhibition of its members' works in London next August and September. By the courtesy of the Council of the Royal Society of British Artists, the exhibition will be held in the spacious galleries of the R.B.A., Suffolk Street, Pall Mall.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) contains the third article of a series on "The Origin and Development of Furniture," by M. Stapley, who now deals with mediæval furniture in a rather inadequate fashion, but with some interesting illustrations. We learn from our contemporary that the Fine Art Commission, originally founded by President Roosevelt without statutory authority, and therefore inoperative, has now been placed on a legal basis by a Bill which was recently signed by President Taft. The members of the Commission are D. H. Burnham, of Chicago, Chairman; Frederick Law Olmsted, jun., of Brookline; Thomas Hastings, Daniel C. French, Cass Gilbert, and Frank D. Millet, of New York; and Charles Moore, of Detroit. Colonel Spencer Crosby, Superintendent of Public Buildings and Grounds of the District of Columbia, has been appointed secretary of the Commission. Would that we had a similar Commission for Great Britain, or even for London! The illustrations this week are of detached private houses of moderate size.

La Construction Moderne (Paris) illustrates the new Hotel de Ville at Redon, the design of which, by M. F. Leray, is founded more or less, rather less than more, on French Flamboyant work. Another building of which views are given is the Chapel of the Monument Expiatoire in the Rue d'Anjou, Paris, of which Messrs. Percier & Fontaine were the architects, between the years 1814 and 1826.

Engineering Record (New York) describes and illustrates a reinforced concrete bridge, recently completed to carry Seventh Street, in Los Angeles, over the Los Angeles river, California. To this an attempt has been made to give an architectural character, but the result is not altogether satisfactory. Another reinforced concrete structure, the Grafton Bridge, across Cemetery Gully, in Auckland, New Zealand, shows an engineer's design rather than an architect's. An interesting piece of underpinning work is that for the Astor Building, Wall Street, New York, to fit it to withstand the presence of its new neighbour, a building for the Bankers' Trust Company, which will be 42 storeys in height. In a paper presented to the American Society for Testing Materials, Mr. Charles Macnichol recommends the treatment of cement and concrete surfaces with zinc sulphate before painting with oil colours, a method of which both theoretically and practically he affirms the success.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

A National Memorial to Edward VII.

SIR,—It is not with any wish to assume an attitude of opposition to the views initially expressed in any subject of correspondence, that I write these few lines. It is rather due to the feeling that such a memorial as suggested would have been so far from receiving the approval of our lamented King.

The position of Charing Cross Hospital is most effectively central for one thing; and moreover, a large portion of the building is quite modern and as up to date as any hospital can be that is not absolutely of yesterday. The waste of money involved in the removal, as suggested, would not at all have appealed to Edward VII.; as large a proportion as possible of the donations and subscriptions to all hospitals, all charities, should be devoted to the immediate work of cure and relief, the minimum being devoted to administrative and building expenses.—Faithfully yours,

PERCY L. MARKS.

49 Queen Victoria Street, E.C.: July 18, 1910.

MESSRS. PARRY & BIDDER, civil engineers, London, who were responsible for the erection of the new bridge over the Marsh Gate crossing at Doncaster, have issued their final report, in which they state that the total cost of the work was 49,048*l.*, the excess of 1,258*l.* above the contract sum being due almost entirely to the extra cost of steel work occasioned by the alterations made at the instance of the Sheffield and South Yorkshire Navigation Co.

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The Architect.

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FORTHCOMING EVENTS.

Monday, August 8.

A.A. Annual Excursion : Ripon, West Tanfield, Kirklington.

Tuesday, August 9.

A.A. Annual Excursion : Leeds, Ansthorpe Hall, Temple Newsam.

Wednesday, August 10.

A.A. Annual Excursion · York.

Thursday, August 11.

A.A. Annual Excursion : Arthington Nunnery, Harewood.

Friday, August 12.

A.A. Annual Excursion : Fountains Hall and Abbey, Markenfield Hall, Ripley Castle.

NATIONAL COMPETITION OF ART SCHOOL STUDENTS.

ARCHITECTURE is poorly represented in the work of the Art Schools, and, considering the many facilities that now exist for the education of architectural students in technical institutions that specialise in this art and are schools for architects rather than art schools, it is a question whether it would not be better for these latter to drop their inadequate attempts to teach architecture. The difficulty is that some knowledge of architecture is necessary for an efficient art teacher, and if those who train for and obtain art teachers' certificates make their own study of architecture simply with the view of their certificates and in the knowledge that they will never be required to teach architectural students, they will be apt to regard their own study of the art without enthusiasm, as a needless waste of time.

The condition of the architectural section of the national competition may be gathered from the fact that no gold or silver medal is awarded to any architectural design or measured drawing, and only some five per cent. of the bronze medals go to architectural students, including those given for measured drawings of old work.

Again, the examiners "regret to note" with regard to architectural design "that some drawings are still sent in which are too bad and show too great ignorance to be submitted for the national competition," whilst the position of architecture as the *mauvais enfant* of art schools is indicated by its productions being placed outside the main exhibition in a narrow corridor where many of the drawings can hardly be seen. In criticism of the architectural drawings from actual measurement, "the examiners note, in the first place, that students place too much reliance on purely mechanical industry." They also, very rightly, deprecate the study of "unprofitable subjects, such as Jacobean mantelpieces, barbaric in detail, and bad in design and proportion."

Among the designs that have received bronze medals are two unsuccessful competitors in the last R.I.B.A. annual competition, viz. Mr. FRANCIS H. MORLEY'S design for a church in reinforced concrete, submitted for the Grissell Medal, and Mr. BERTRAM E. LISLE'S design for a Shakespeare Memorial Theatre, submitted for the Soane Medallion. Other designs which have obtained bronze medals are Mr. JOSEPH H. FARRAR'S design for offices for an assurance company and Mr. CHARLES T. PLEDGE'S design for Council offices for an urban district on the south coast. Both of these are fair in their general scheme, but lacking in detail, especially in the crude attempts at figure drawing and sculpture.

Measured drawings which are worthy of note and of sufficient excellence in the eyes of the examiners to merit bronze medals are Mr. GEORGE B. CARTER'S sketches, Mr. CECIL T. HEWITT'S drawings of schoolhouse, Risley, Derbyshire; Mr. JOHN L. NORTHAM'S drawings of St. Paul's Church, Sheffield; Mr. HORACE J. SADLER'S wrought-iron chancel screen and gates, All Saints Church, Derby, which are in the manner of TIJOU. Although only rewarded with a book prize, Mr. W. ARTHUR RUTTER'S drawings of St. Peter's Church, Peterstone, are interesting, as much from the quaintness of the subject as from the excellence of the delineation.

In the other branches of art study besides architecture, there is a plethora of good work, rewarded with fourteen gold medals and ninety-two silver medals, not to mention bronze medals and commendations.

Miss ALICE M. CAMWELL'S enamelled bracelet and gold pendant are charming pieces of jewellery, in which enamel and stones with wire-worked gold are exquisitely combined and a delightfully old-world effect produced. Whether it would be commercially successful is another question, probably the popular taste would run more to the silver medal designs adjacent in silver and moonstones, with emeralds and enamel.

Mr. EDWARD RIDLEY'S design for a stained glass window is remarkable for the expression of idea in the illustration of the moral lessons conveyed by the legends, "Whereunto is money good?" by the story of St. MARTIN of Tours; "Who has it not wants hardihood," by JESUS and JOSEPH, in the carpenter's shop, making a boat for the Sea of Galilee; "Who has it has much trouble and care," by the rich young man of the parable; "Who once has had it has despair," by DIVES in Hades. The detail of the drawing and the colouring of the individual pictures is good, but there is a lack of unity between the four parts in both composition and colour scheme.

Mr. LESLIE M. WARD'S designs for book illustrations are capital examples of black and white drawing, and his treatment of the various schemes, which all deal with shipping, is individual and expressive. Mr. FRANK LONGBOTTOM'S design for church door-handle and lock-plate is thoroughly the work of a smith; the handle is sensible and good in form, the iron plate work a little too insistently Gothic in its use of tracery forms in sheet-iron suggestive rather of fretwork. The modelling of Mr. CLIVE E. WRIGHT is good as a rendering of design based on a flowering plant, but the chalice is not good as a whole, the lines of the design being too much broken by bands of ornament. The modelled design for *repoussé* silver tankard is admirable in composition with a delicately wrought band of figures in Bacchanalian procession, that would surely need considerable chasing to supplement the work of the hammer.

Miss ELIZABETH HANCOCK'S group in oil-colours is an admirable piece of still-life painting which owes much to

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the admirable lighting of oysters and haddocks and the clever technique in the rendering of the glass bottle. Miss LUCY PIERCE has some excellent designs for colour printing, in which impressionistic treatment of the colour is characterised by the examiners as "a little accidental." The colour is good and satisfying in each case, and we do not quarrel with the absence of definiteness.

A fine piece of modelling is the anatomical figure by Miss DOROTHY MUNRO, which not only takes a gold medal but brings its author the Princess of Wales's Scholarship of 25*l*. Almost equally good in its way is the monochrome painting of figures from the antique by Miss MARJORIE BATES, who wins a Princess of Wales's Scholarship of 11*l*. as well as a gold medal.

Two charming pieces of work are shown by Miss DOROTHY BUSSE and Miss FLORENCE GOWER, both mirror frames, that of the former painted and of the latter stained wood, very clever in execution and full of imagination, whilst delightful in colour and composition. Miss LOTTIE MAY AYERS has a very finely modelled and spirited composition from the nude, whilst Mr. WILLIAM H. WRIGHT's modelled design for a doorway with a panel in low relief we should like to see realised. Excellent as is the gold medal work, there is much that falls not far short in the productions of the silver medallists that is worthy of praise if space permitted.

NOTES AND COMMENTS.

FOR a cheap jibe at architects commend us to the *Times*. Referring in a leaderette to the report on Long Railway Tunnels given by Mr. FRANCIS FOX to the International Railway Congress, and "his statement that he had seen girders, carrying some of the heaviest buildings in London, in which the webs of the girders, originally an inch in thickness, had been reduced by corrosion to the thickness of a sheet of writing paper," the *Times* says "it is nothing short of criminal for architects to avail themselves of such girders in construction, and then to neglect to have them periodically examined and protected under the supervision of competent inspectors."

CAN the *Times* enlighten our ignorance by giving us the names of any dozen modern buildings in England, exclusive of those under the care of Government departments or municipal authorities, in which the architect who originally designed them and superintended their construction had any control over their painting three years after their erection was completed? We say three years, because the painting that architects require usually lasts that time at least.

THE amusing part of the joke is that "from the report that appears in another column" of the same issue of the *Times* we learn that Mr. Fox was speaking of the tunnels of the Metropolitan and District Railways, of which we believe the construction was designed and superintended by engineers, and the owners of which keep a regular staff of engineers.

OUR personal observation teaches us that the Metropolitan and District Railways are not the only ones of which the ironwork has been dangerously reduced in strength by corrosion for want of paint, but we are not aware that architects had anything to do with their construction or maintenance.

INCIDENTALLY the recent investigation by a commission of architects and engineers of the present condition of the famous leaning tower of Pisa has brought into prominence the names of two English students of architecture to whose zeal and careful work we owe much. TAYLOR and CRESY are names known to all English students of the antiquities of Rome, but they seem to have been forgotten by the Italians as the authors of "Architecture of the Middle Ages in Italy," in which are contained what may reasonably be presumed to be accurate measurements of the inclination of the Campanile in 1817, and now most useful as data from which it can be shown that the tower has moved a further 10½ inches out of the perpendicular during the last ninety-three years. Letters to the *Times* from Mr. ARTHUR T. BOLTON, F.R.I.B.A., and Miss A. CRESSY (*sic*), the last surviving child of the architect, have revived the connection of TAYLOR and CRESY with the leaning tower of Pisa.

LIVERPOOL'S first Garden Suburb, the foundation-stone of the first house on which was laid by Lady SALISBURY on July 20, comprises 180 acres of land, which has been leased for the purpose to the Liverpool Garden Suburb Tenants, Ltd., by Lord SALISBURY. The movement is one in which Lord and Lady SALISBURY and Lady GWENDOLINE SALISBURY have taken a great interest. They have visited and inspected other estates in different parts of the country which have been developed on similar lines, and have expressed themselves as thoroughly in sympathy with the garden suburb movement and pleased with the tasteful way in which the gardens have been laid out.

THE Lord Mayor of LIVERPOOL entertained at luncheon the Marquess and Marchioness of SALISBURY prior to the laying of the foundation-stone of the first house, and the Marquess, in responding to the Lord Mayor's speech expressing his gratitude for the assistance given to the Corporation in the formation of the boulevard round the city, said that what he had done had been from a business point of view quite as much as a philanthropic one. He was only too glad to co-operate with the Corporation when they approached him with reference to developing the property just outside the city on garden city lines. He expressed the hope that the new system which they were inaugurating would lead to the development and betterment of the housing conditions in all the large cities.

MR. HENRY VIVIAN, M.P., Chairman of Copartnership Tenants, Ltd., in responding to the toast of "Success to Liverpool's Garden Suburb," proposed by Sir WILLIAM BOWRING, Bart., said that the principle of sound business underlay the Society, which he should be sorry to see associated with anything approaching gushing sentimentality. They had secured from Lord SALISBURY 180 acres, on which they proposed to erect 1,800 houses, with one acre in every ten reserved for open spaces and recreation. They were going to spend half a million of money within the next five years, and of this Lord SALISBURY was himself going to supply them with 10,000*l*. capital, and he would therefore be their first and biggest investor.

BIRMINGHAM, too, is moving with the scheme to which we have already referred for exercising powers under the Housing and Town Planning Act, 1909, in the parishes of Quinton, Harborne, Edgbaston, and Northfield. By the recent inclusion in the city boundaries of the semi-rural parish of Quinton, and the association with it of the further portion of Harborne, the City Council is placed in control of an area of about 830 acres lying to the south of Quinton Hill, Beech Lanes, and Hagley Road, and extending to the boundary of the King's Norton and Northfield area, in the vicinity of Selly Oak and California and Woodgate. The City Council a little over a month ago decided to schedule the area for a more systematic laying out, and on July 20, a memorable day for the historian of town planning in England, a statutory meeting of property owners was held at the Council House to hear from the Lord Mayor and others a general description of the scheme, which will in due course be submitted for the approval of the Local Government Board. It was very clearly pointed out that the object of the Council is to bring landowners and builders into co-operation. There will be no pressure upon them to develop their land for building before they consider the time is opportune. The development will be piecemeal, as under ordinary circumstances, but it will proceed upon a prearranged general scheme, with timely provision for adequate open spaces, and with a certain amount of regulation as to the number of houses

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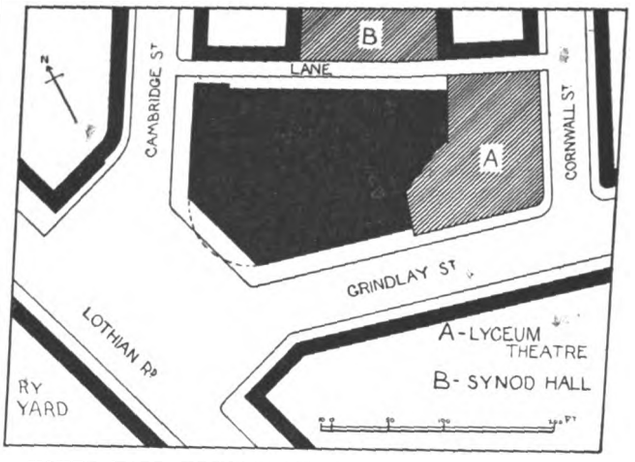
to be erected to the acre, ten per acre being suggested as the maximum.

WE do want a Fine Art Commission for London, such, as we noticed last week, has now been legally established in the United States. Then there would be less probability of such a stupid and easily avoided mistake as Mr. F. W. SPEAIGHT has pointed out in the location of the Royal Artillery Memorial in the Mall, which he says, in a letter to the *Times*, "is supposed to be on an axial line with the Duke of York's Column, but, as a matter of fact, its central feature is some feet to the right of the column." Mr. SPEAIGHT appeals to the Royal Institute of British Architects to look after such matters. The Institute, we are sure, would be only too pleased to have its Art Standing Committee empowered to act, or to depute some of its members to exercise the functions that have been entrusted to the eminent architects of the United States.

AN interesting antiquarian work is shortly to be published descriptive of the excavations at Glastonbury Lake Village. This remarkable settlement of early man was systematically explored from 1892 to 1907 on behalf of the Excavation Committee of the Glastonbury Antiquarian Society and a Committee of the British Association. The work was first undertaken by Mr. ARTHUR BULLEID, F.S.A., the discoverer of the site, and later Mr. HAROLD ST. GEORGE GRAY was associated with Mr. BULLEID in the enterprise. These two gentlemen are now editing the book, for which Mr. ROBERT MUNRO, the author of "The Lake Dwellings of Europe," has written an introductory chapter, and reports by experts on the remains found on the site will also be included. The importance of the Glastonbury Lake Village in the history of pre-Roman Britain can hardly be overestimated, giving as it does a vivid picture of native life before the arts of Rome penetrated to the West of England. The village had its origin in the Early Iron Age, and has contributed very largely to our knowledge of the arts and industries of Late-Celtic times. The work is to be published by subscription, and the editors hope to issue the first volume before the close of the present year, and the second within about eighteen months. The volumes will be profusely illustrated with plates from photographs taken by Mr. ST. GEORGE GRAY, sectional diagrams, &c.; one particularly noteworthy item being the reproductions of the weaving combs found in the village, showing their really wonderful ornamentation.

ALFORD, in Lincolnshire, possesses in the chancel of its church a monument of considerable interest, and in regard to a proposal to remove it to another position Mr. F. P. BARNARD, Professor of Mediæval Archæology in the University of Liverpool, has addressed to the townsfolk the following remonstrance, which, in its reference to EDWARD STRONG, father and son, is of more than local interest:—"A proposal having been made to take to pieces the magnificent monument to Sir ROBERT CHRISTOPHER and shift it to another part of the parish church, it becomes a public duty to call the attention of the inhabitants of Alford to the danger that threatens the most precious relic of English art which they have inherited from the past. It is probably not known to the originators of a most mischievous project that this fine monument is the work of one of the greatest of British sculptors, EDWARD STRONG, junr., an artificer and mason-architect of unsurpassed skill, who, with his father, EDWARD STRONG, sen., and Sir CHRISTOPHER WREN, collaborated in the building of St. Paul's Cathedral during the whole of the thirty-six years occupied in that undertaking, and whose assistance was indispensable to WREN, himself originally an amateur. Alford thus possesses in this monument a memorial of artistic and historical value such as any church or cathedral, any town or city, in England might justly be proud of and should naturally cherish with the most affectionate care and solicitude. Apart from the sentimental reasons that deter persons of refinement from meddling with a tomb, no interference with an extremely delicate structure of this character could possibly take place without its suffering irreparable damage; and as one who can speak with authority on the subject, I beg that nobody will believe any assertions to the contrary, assertions which, after all, are opposed to simple common sense. Its removal would be an act of barbarism which it seems incredible could be perpetrated in these days."

THE USHER HALL COMPETITION, EDINBURGH.



USHER HALL, EDINBURGH.—BLOCK PLAN OF SITE.

THE conditions of the competition are, we take it, sufficiently well known to require nothing more than a brief résumé.

The Corporation of Edinburgh, "in accordance with the gift of the late Mr. Andrew Usher," issued some months ago a general invitation to architects to submit designs for a large concert hall, the estimated cost of which (exclusive only of decorative painting and furnishing) was not to exceed 65,000*l.* To this invitation 132 firms responded. Sir Aston Webb, in association with Mr. Williamson, the city architect, was appointed assessor. Premiums of 250*l.*, 150*l.*, and 100*l.* were offered for the designs placed respectively second, third, and fourth.

The chief features in the schedule of requirements may be enumerated as follows:—The provision of (1) a main hall capable of holding 3,500 people, 3,000 of whom were to occupy the auditorium (on the floor and in galleries at the discretion of the competitor), the other 500 being accommodated on the platform. An alternative arrangement of the platform, allowing for an orchestra of 100 performers and a chorus of 350, was also to be presented. The seats throughout were to be so arranged as to permit of ready and definite classification, and the staircases and gangways disposed with that end in view. The floors of the hall and galleries were to be properly graded, and a proportion of the seats in both areas constructed as fauteuils. Importance was laid upon the necessity of devoting particular attention to acoustic requirements. (2) Crush hall, lounge foyer and box offices. (3) Cloak and retiring rooms for ladies and gentlemen in various parts of the house. (4) Space for grand organ (in or adjacent to platform), and for incidental machinery. (5) All necessary accommodation, including independent external access, for artists and orchestra. (6) Adequate servants' quarters, storage for platform seats, coal, &c. (7) Space for heating and ventilating plant, kitchen and relative offices. (8) Main, subsidiary, service and emergency staircases. In all corridors and passages, inclines (not exceeding 1 in 10) were to be preferred to steps. For every tier or floor accommodating not more than 500 persons, two separate exits were to be provided; and for every 250 or part of 250 persons above 500 an additional exit. In view of the proximity of the Lyceum Theatre and Synod Hall elaborate precautions were advised against the risk of fire, though for administrative purposes it was suggested that it might be convenient to connect the new building with the Synod Hall.

The drawings required were limited to plans of each floor, two main elevations and two sections, longitudinal and transverse—all to $\frac{1}{8}$-inch scale, and finished in either ink or pencil and wash. In addition three $\frac{1}{2}$-inch details had also to be submitted—one external and one internal bay, and a cross

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section of the hall. The method of rendering perspectives was left to the competitor.

The actual site selected by the Corporation is an area of ground bounded by Cambridge Street, Lothian Road, Grindlay Street, the Lyceum Theatre, and a lane connecting Cambridge Street with a parallel thoroughfare, Cornwall Street. The ground is at present occupied by a pseudo-Gothic school building, which will shortly be razed. It is not an ideal site, and although the position is convenient and central enough the environment is most unfortunate. Directly facing what would naturally be the principal façade in any well-conceived design, viz., the front to Lothian Road, there is a large shunting and goods yard belonging to the Caledonian Railway—a depressing and quite unalterable circumstance. It is separated from Lothian Road by a wall about 8 feet high. The adjacent buildings are more or less inconsequent. The Synod Hall is a nondescript stone product of the Victorian period (rushed up in the prodigiously short space of three months), whilst the elevations of the Lyceum Theatre are worked out in stucco in the conventional manner—weak Corinthian pilasters and a trifling distribution of windows and niches eked out with meaningless detail.

With these factors in mind we have no hesitation in agreeing that the selected design, the work of Messrs. Stockdale Harrison & Sons and Mr. Howard H. Thomson, of St. Margaret's East, Leicester, is a thoroughly appropriate performance, but in its effect on the Art of Architecture in Great Britain we believe the decision arrived at in this case to be one of the most complete disasters in open competitions that has occurred since the London County Hall award. There is indeed a certain similarity in the characters of the winning schemes in the two instances. They have in common the same mediocre obviousness, the same lack of idea. Reading between the lines of Sir Aston Webb's report, and considering the merits of other designs exhibited, it is, to our mind, clear that the winning design is not the best submitted—but the best under the circumstances and conditions, and particularly under the limitation of cost. The Corporation of Edinburgh have in short asked too much for their money, and have got their money's value and no more.

Messrs. Stockdale Harrison & Sons and Thomson have produced a solution of the problem which, both as regards plan and elevation, is simply an extension of those principles of design commonly associated with suburban free libraries, where much is demanded for inadequate expenditure. Whatever it may be it is not Architecture. Happily, through the authors' forethought and skill in evolving a scheme below the estimated cost, there is a margin of 3,000*l.* for improvement. But our concern is not with elementary blunders. The vital objection to the selection of such a design is an altogether more serious matter.

In the first place the axis of the middle entrance is many degrees off that of the open space towards Lothian Road, west of the site. It must be obvious that the coincidence of these axes should be a primary consideration. The whole value of the space as an architectural setting is abandoned if this necessity be neglected. One has merely an angle-botch instead of a great central monument. The actual massing on the circular face has been managed in the most immature fashion. Three rectangular projections crowd on each other and form "features"—a wonderfully naïve achievement. The main lines of the superstructure (so depressed as to be quite invisible even from Lothian Road) have the same smug banal quality as the lower portion of the design. Externally the minor composition and detail is of the kind which for lack of a more definite term may be called "Early Carnegie." Pernicious tricks of detail that have arisen in the last fifteen years of our architectural practice are reproduced and even exaggerated, and a facile abuse of established motives is made to serve as scholarship. We understand Sir Aston Webb has described the style of the building as "English Renaissance." We think Inigo Jones or Cockerell would have had another name for it.

Mr. Simon's design, placed second, gains enormously from its position on the stand next to the winning scheme. Still without any such foil it is, in the main, a remarkably fine conception. The great central block, standing out from the sweep of the rotunda and the lower flanking masses make a great impact on the imagination. In its smaller parts the design fails rather unaccountably. The two circular pavilions on either side of the dominating feature seem to us particularly unhappy—both unpleasant features in themselves and, by reason of their shape, altogether unfitted for such a position. Another and even more incomprehensible mistake occurs at the point where the flanking blocks join the rotunda. The angles are filled in by convex curves, which are continued above the blocks as little domed towers, breaking into the entablature that crowns the rotunda and stopping short under the cornice. We are quite at a loss to find an explanation for such a wanton destruction of the most important lines of the superstructure. The uninterrupted sweep of the great entablature is essential to the success of the whole composition, and yet for no apparent reason the frieze and architrave are sacrificed to an insignificant ill-advised feature. Still in spite of these inconsistencies, the author has succeeded in producing something veritably in the grand manner. The plan we think to be the best submitted. It is unique in that the platform occupies the Lothian Road extremity of the site, and the main entrances are from Grindlay Street and from the lane, which Mr. Simon has considerably widened. The placing of the crush hall in the subsidiary block at the back of the site is in itself a brilliant solution of the problem. Above it, on the first floor is the foyer and promenade, gained by a well-conceived circular staircase. The shapes of these rooms and of the buffet are very skilfully managed, and their architectural relation to each other is beyond criticism. Everywhere throughout the plan there is abundant evidence of French influence. The adroit arrangement of the various departments, the adequacy of the provision in each case, and the perfect propriety of the plan as a whole all bear the distinctive stamp of the Beaux-Arts. The heating and ventilating chambers are very satisfactorily disposed of, and the furnace chimney thrust away in the least conspicuous corner of the site. The treatment of the interior is remarkable for its breadth and the competence with which difficult decorative problems are handled. The detail is sumptuous, but Mr. Simon has obviously too much scholarship to degenerate into coarseness. The scale as in the exterior is well preserved, but nowhere is it quite comparable to that attained in the great centre feature. On this Mr. Simon appears to have lavished most care. It is the supreme achievement of the design, and like the perspective is beautifully drawn and rendered.

The third premiated scheme, by Mr. Henry Edward Clifford, 225 St. Vincent Street, Glasgow, is the only rectangular solution placed. The axis of the hall runs parallel with the longitudinal axis of the space towards Lothian Road. In the plan itself no resolution of parts is attempted, and beyond the fact that the building could be rapidly cleared on emergency, we fail to understand the principle on which it could commend itself to an assessor. The disposition of the seating accommodation is straightforward, but has been thought out without any realisation of the possibility of the opportunity. It is all very dull and lacking in breadth. The decoration of the interior is irrelevant and vulgar. Panelling in many scales spreads itself over inappropriate surfaces and flaccid leaves are applied with an unerring instinct for the least fortunate place. The exterior, though better in proportion, lacks force and significance. An inordinately heavy portico has been relied upon to transform the mass of the building into an architectural composition. And it does not succeed in so doing. There are the inevitable dog-eared archivolts to the windows and persistent resort to swags in all times of trouble. The massing of the attic is quite misconceived.

In the selection of the design awarded the fourth premium—the work of Mr. William Heywood, 245 Bristol Road, Birmingham—we might be tempted to perceive the first official recognition of the neo-Grec movement, were it not for the fact that we know that style and manner of expression go for nothing in these matters. Mr. Heywood's treatment of the site is extremely bold. By cutting through a new way connecting Grindlay Street and the lane at the rear of the Synod Hall, he obtains a simpler basis for his main building and is able to accommodate his administrative offices (committee rooms, agents' room, box office, &c.) in a subordinate block adjoining the Lyceum Theatre. Apart from the advantage of thus gaining an easily handled main area, its isolation from the surrounding buildings is in itself a material safeguard against fire. The main lines of the plan which Mr. Heywood has adopted are octagonal, the broad faces are similar in composition, and the lesser planes also echo each other. Internally and externally this conception is a definite unit, a complete whole. It is thought out with a power of consistently sustained logic that makes it incomparably the cleverest arrangement submitted. It cannot be divided up and considered as so many separate sections. It cannot even be altered without sustaining harm. To attain this degree of absoluteness in a Doric design is difficult enough, but to reach the goal through the Ionic medium involves a tour-de-force. And this Mr. Heywood has achieved. We could have wished to have been shown more of the actual detail—particularly the rich cornice and frieze of the octagonal attic block.

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It is to be regretted that those responsible for the conduct of the competition have thought it desirable to withhold the names of the unsuccessful competitors (unless the latter definitely express a wish to the contrary) even after the results have been declared. We cannot see that any good purpose is served by this policy and it undoubtedly tends to rob criticism of a great part of its value. Designs are denoted only by numbers, so that a brief reference to those of special merit must take the place of an adequate review.

No less than five neo-Grec designs, beside that of Mr. Heywood, were submitted. No. 121, shown in a series of rather sketchy, but on the whole adequate drawings, has real freedom, and is very freshly conceived. The detail is a trifle uncertain. No. 109 is from the hand of a master. We only know of two men in the country who are capable of producing such a work. One did not enter for the competition, and of the other we have no recent information. The design is full of a superb vigour. The massing is handled faultlessly, and the composition down to the smallest detail is worthy of Messrs. McKim, Mead & White. A double Corinthian colonnade standing on a rusticated basement is surmounted by a curved attic. Behind this attic or drum a flat dome rises, finishing in a low lantern. The colonnade is flanked on either side by masses crowned with sculpture and the basement is pierced by arched openings. The plan is one of great beauty. But the chief excellence of the design lies in the conception of the exterior—the welding together of every individual part into a great complex unity.

A scheme of some originality bears the number 95. Its plan is a double oval, the inner curve rising clear above the lower, and broken by masses in a fashion partially reminiscent of Mr. Simon's scheme. Though distinctly clever in parts it has an air of impossibility, and the very German figures carrying the roof of the crush hall and porte-cochère are intolerable. No. 69 is a semi-circular solution of the problem, with a rectangular projection to Lothian Road that appears to have been inspired from two distinct sources. The towers and the main outline have a proto-type in a design for a London church by Cockerell, and the portico—Ionic superimposed on Doric—seems to us to be a variation of a bay of the stoa in the Agora, Pergamon. The design is most exquisitely proportioned and charmingly detailed, and its dainty refinement loses nothing from the fashion in which it is drawn and rendered. A stronger neo-Grec work is labelled No. 31. In its dignified nobility there are few designs comparable to it in the room.

Of the American type three examples were presented. The best, No. 31A, might have come from the atelier of Cass Gilbert, but for its definitely Greek feeling in certain respects. A recessed Doric colonnade with lofty arched windows in the intercolumniations, stands between end blocks of massive solidity, upon a low powerful basement. On the centre of the sill of each of the three great windows is placed a light little figure employed as by Dance the younger in his Newgate Prison design, to increase through contrast the Titanic scale of the architecture.

Nos. 89 and 64 are more French in character, both admirable and both curiously enough rendered in perspective by the same artist—the technique is unmistakable.

ROYAL ARCHÆOLOGICAL INSTITUTE.

By OUR SPECIAL REPRESENTATIVE.

(Continued from last week.)

THE excursions of the Royal Archæological Institute to places outside the city of Oxford commenced with an hour's motor ride to Dorchester on Wednesday, July 20.

Dorchester.

The village is in itself a remarkable one, being one of the oldest cities in the country, and traces of the Roman occupation and of the British camp are in evidence. The church is of unusual plan and possesses an interesting history Mr. W. H. St. John Hope dated the beginning of the first building to 634, when St. Birinus (a missionary sent by Pope Honorius) built a church on the site, and this endured until the Danish invasion. The next most important date is 1075, when the Council of London ordained that certain episcopal sees, including that at Dorchester, should be transferred to more populous centres. Remigius, a Norman prelate, was the last Bishop to hold office at Dorchester; he was transferred to Lincoln in 1085. The secular clergy, however, remained behind until in 1140 Alexander, Bishop of Lincoln, founded here a college of Black or Austin canons. As the latter lived according to rule, the constitution of the church was changed. The building was consequently divided between the parishioners and the canons. Whether the Austin canons commenced to build a church immediately after their arrival Mr. St. John Hope said he could not tell for certain; anyhow, they soon reconstructed practically the entire church. The religious house went on until 1534, when it was permanently suppressed. The buildings were however bought by a wealthy citizen, Richard Beauforest, for 140*l.*, and he presented them to the parish. Very little is known, according to Mr. Hope, of the history of this abbey between the times of its foundation and suppression. It was beyond question originally without aisles, though of cruciform shape. There is at present only one arch at the crossing, and it was difficult to believe that there was ever one to the east of it. Probably there was a large wooden belfry over the nave at the crossing. The Austin canons always denied that the relics of St. Birinus had been transferred to Winchester in 707, alleging that nothing but false bones were removed. The first extension was for the purpose of providing a worthy resting place for the shrine. This occurred in the thirteenth century, and was on the north side. Probably a corresponding aisle was erected about the same time on the south side of the choir, but all traces of it have disappeared. The fact that the arcade opening into the north choir aisle is fourteenth-century work was explained by Mr. Hope, by assuming that the belfry or steeple at the crossing was blown down, or fell down, destroying the original walling and necessitating the erection of the present extraordinarily beautiful arcade with its mouldings of such astonishing delicacy. At the time they rebuilt the arcade they broadened out the south choir aisle. About 1320 the parishioners began to think that something ought to be done for the beautification of their portion of the church. But as the monastic cloister ran outside the north wall of their nave they had to rest content with building to the south an aisle as wide and as long as their nave. In doing so the graveyard was seriously encroached on, so they provided a bone-hole underneath their new altar. This is often described wrongly as the crypt; the opening in the wall down which any bones found could be thrown, is still to be seen. The extension eastwards of the monastic choir occurred in 1330. The fittings are with one or two exceptions the work of Mr. Butterfield. Mixed up with the modern glass are numerous fragments of the ancient. The east window is divided into two by a solid stone buttress for the greater part of its height; but the present wheel window which fills the entire top (the solid masonry stopping below it) is a modern reconstruction. Mr. Hope suggested that as the ground sloped eastwards an extra buttress was required for supporting the east wall. The window to the north of it is the celebrated Jesse; while that to the south contains most interesting carving. Under it are the sedilia and piscina, the former having at their backs three curious small windows. In the south chancel aisle are four remarkable altar tombs and two brasses. The two chapels in this aisle had groined vaulting springing from central pillars; this was reproduced by Sir George Gilbert Scott in his restoration. The vigorous altar tomb of an unknown armed knight offers ground for speculation as to whether he is meant to be drawing or sheathing his sword. In the nave aisle is a Norman lead font, with figures of the eleven apostles round the sides.

The next halt was at Wallingford. St. Leonard's Church has traces of early work, a Norman doorway, and two elaborately carved arches opening respectively into the chancel and the apse. The late Mr. J. Park Harrison ascribed the carving to pre-Norman date, though with this contention Mr. Hope disagreed. A visit was also paid to Wallingford Castle, where the Rev. J. E. Field pointed out the earthworks and other remains.

Ewelme.

On arriving at Ewelme, Professor Osler described the quadrangular brick building known as Ewelme Hospital, which is entered through a brick archway of decidedly Flemish character. It has a direct connection with Chaucer the poet, for his son Thomas obtained through marriage the manor here. His only child Alice had for her second husband William de la Pole, Duke of Suffolk, who was one of the prominent warrior-statesmen of the day. He became exceedingly unpopular on account of the loss of the French provinces, and was murdered in 1450, while attempting to fly from the country. The three principal benefactions with which the name of himself and his wife will always be associated are the church, the hospital, and the grammar school. In 1437 the king granted a licence to the earl and countess (as they were then) to found an almshouse, to be called God's house, for the support of two chaplains and thirteen poor men. The allowance given to the almsmen was first 12*d.* per week;

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in 1634 it was raised to 2*s*., in 1860 to 9*s*., and in 1373 to 10*s*. The masters until the Reformation were in orders. From the time of James I. the mastership has been vested in the Regius Professor of Medicine. The buildings of the almshouse form a quadrangle; each occupant has a sitting room and bedroom, and a piece of garden. The almsmen have to attend a daily service in St. John's Chapel in the adjacent church, where formerly their duty was to pray for the souls of the founders. The existing hospital records fall into four groups, and they are to be found in the Bodleian. First, the fourteenth-century grants of various manors to the De la Poles, numbering in the library from six to nineteen; the earliest is 1358. Second, the royal licences with the seals attached; the licence to found the hospital is dated July 3, 1437; their library numbers are twenty to twenty-four. Third, the beautifully written and illuminated copy of the statutes, which is number twenty-six, and is hung between two glasses in the muniment room. Fourth, the court rolls, the audit accounts and the stewards' accounts of the manors and of the hospital—numbers thirty to thirty-five. These are of great interest, as they give in many places the values of stock and the wages.

The grammar school, which was founded at the same time, was kept up until 1810, when the Rev. D. G. Faithful was appointed. Although he never resided here he held the position for sixty-three years. On his death no appointment was made. The school-house is now used as the village school, and is one of the most successful in Oxfordshire. Like the hospital it is built of brick. The property of the estate is now under the control of the Charity Commissioners, and is administered by twelve trustees. In 1445 the total receipts were 108*l*. 16*s*. 10*d*., in 1500 they were 173*l*. 1*s*. 11*d*., in 1600 176*l*. 18*s*. 6*d*., in 1700 383*l*. 16*s*. 5*d*., in 1800 250*l*. 12*s*. 7*d*., in 1850 1,195*l*. 13*s*. 5*d*., while last year these total receipts amounted to over 4,000*l*. In 1873 the Charity Commissioners decided that a third of the net yearly income should be applied to educational purposes. They now offer this money in scholarships, a certain number of which are limited to the children of tenants.

A move was next made to the fine church, entered through the tower at the west end. A description of the interior was given by Mr. Aymer Vallance. The oldest part, he said, is the western arch, all the rest having been rebuilt in the fifteenth century through the munificence of the Duke and Duchess of Suffolk. In the north-west part of the nave is a very beautiful font and richly canopied font cover; the latter has unfortunately been restored and varnished. The church is thought by some people to have been copied from the church of the Suffolks at Wingfield. At any rate it possesses a feature familiar enough in East Anglia (as also in the West of England)—a feature of which there is only one other example in Oxfordshire, viz., screens extending right across the church from side to side. The screens at Ewelme are of the fifteenth century, and were erected almost contemporarily with the church, but before the rood-loft. The latter, an afterthought, was entered at the north end. The screen is a remarkable one, especially because of the fact that the uprights beneath the tracery consist of iron bars let into wooden caps and bases. Unhappily the screen separating chancel from nave was cut down some 27 inches in 1843, thereby destroying its continuity. It was designed to stretch in an unbroken level across the whole church, 46 feet. Its original height can be gauged from the screen across the south aisle which has not been touched. When the screen was cut down it was also painted and grained to imitate oak. It was only by accident in 1906 that it was discovered to be really fifteenth-century work. The Rector then immediately took steps to remedy the damage by clearing off the yellow graining from the rood-screen and south screen, and in doing so he found traces of the original colour.

Of extremely high interest are two tombs in the south chapel, viz. (1) that of Thomas Chaucer and his wife, with brasses attached, and (2) that of their daughter Alice, Duchess of Suffolk, co-founder of the hospital. Mr. Vallance was strongly of opinion that the latter first stood elsewhere—possibly before the altar of the south chapel. When the chapel itself was enlarged by her son the tomb of Duchess Alice appears to have been moved, possibly to make way for an intended tomb of his own.

The Duchess's tomb suffered severe curtailment in being moved to its present position in an opening in the wall between the chancel and south chapel. The panels do not stand in their original order, and the ends were hacked away in order to make the tomb fit into the bay. The elaborate stone canopy above is forty or fifty years later in date, and according to Mr. Vallance was probably introduced to mask the cutting away of the walls necessary to make an arched opening for the tomb. The eight wooden figures of angels on the upright shafts are extremely rare; they measure from 22 inches to 24 inches in height. From the marks at the back he supposed that the figures at one time belonged to some other structure. If the canopy had been designed as a complete whole the angels would have been carved in stone. The figure of the Duchess is life size, and is of alabaster, which might have been quarried at Chellaston, Derbyshire, and worked in Nottingham. The figure itself is most beautiful and dignified; on the left arm is the Garter. The inscription round the tomb is, in the opinion of Mr. Vallance, probably a fraudulent one dating from 1843; he based this belief on the fact that it is inaccurate historically, and also its wording does not correspond with the customary wording and spelling of the fifteenth century. Mr. Vallance mentioned that the small covered passage at the east end connecting the almshouses with the tower had two doorways open to the ground in each side wall. These were made in order that it might be possible for processions to make a complete exterior of the circuit of the building when required. Thus in ratifying the foundation in 1463 of a collegiate establishment at Cobham Church, Kent, the Bishop expressly stipulated that the buildings for the residence of the staff were not to be placed so close to it as to interfere with the procession way.

After an opportunity had been given for the large party to look over the church with its fifteen or twenty brasses, the old woodwork, a finely carved ceiling of Spanish oak in the south chapel, and the screens, a move was made to a residence close by where tea was served in a marquee. Before leaving Professor Boyd Dawkins proposed a graceful vote of thanks to Professor Osler both for his hospitality and for his account of the hospital. Before getting into the motor conveyances for the return to Oxford a hasty visit was paid to the curious fifteenth-century grammar school, which is connected with the hospital.

Thursday, July 21.

The day's visits were confined to places in Oxford. A commencement was made at Merton College (see *The Architect*, May 8, 1908), where Mr. Aymer Vallance conducted the party round the three quadrangles and into the chapel, hall and library. Next the party visited Queen's College, where they were met by the Rev. J. R. Magrath, D.D., the provost, who contributed to our series of Oxford Colleges in an article which appeared in April of last year. The crypt of St. Peter's in the East, Oxford, which is close by, was described in the following paper by Mr. C. Lynam, F.S.A.:—

Crypt, St. Peter's in the East.

Amidst the comparative scarcity of crypts Oxford possesses two, viz. this at St. Peter's, and the other, when built, was part of the church of St. George, said to be just outside the boundary of the ancient castle. However, it is further said that the crypt there is a rebuilding. It is to be remembered that these underground buildings, though not by any means numerous, are to be met with in various parts of the country, and that some of them go back to the earliest period of any remains of our ecclesiastical architecture, and that nearly all of the remainder are of the earliest work succeeding the Norman Conquest. The crypts of the cathedral of Ripon, and of the abbey church of St. Mary at Hexham, are commonly accepted to be of the seventh century—the age of Wilfrid. At Repton in Derbyshire, and Brixworth in Northants, and at Wing in Bucks, they are of pre-Conquest origin. At the cathedrals of Worcester, Gloucester, Winchester, Canterbury and Rochester they represent the earliest existing parts of these buildings, being of the eleventh or early twelfth century; whilst at Hereford there is a characteristic example of the early thirteenth century.

In Oxford there is perhaps the most important instance connected with a parish church, and moreover it is stated by Murray's contributor that when the restoration of the cathedral took place in 1856 there was found at the east end of the nave a very small vaulted chamber which might well have formed part of a crypt of the class of Ripon and Hexham, the earliest of any of those that now exist. At Tenby in Pembrokeshire there is a small crypt about 17 feet by 13 feet, but of very late date; and at Malpas in Cheshire there is a like example. At Tamworth in Staffordshire there is a crypt on the south side of the church which has served as a receptacle for human bones, such as may be seen in the churches in Brittany, and not unlike the vault at Bosham in Sussex.

In the years 1862-3 a great excitement took place in Oxford by reason of persistent statements being made that from the western central opening in this crypt there was a continuous underground passage at least to the extent of the west wall of the church itself. The Oxford Historical and Architectural Society, in existence then and extant now, very

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zealously took up the question and finally by making excavations and careful examinations positively proved that no such extension westward existed or ever had existed, and a plan and longitudinal section of the crypt drawn to scale appeared in their Journal for their first meeting for Trinity term 1863.

On plan the crypt consists of an enclosed rectangular area of 36 feet in length by 21 feet in width, and this is divided into what may be called a central nave with an aisle on either side, the nave being 6 feet 7 inches wide within the walls, and each of the aisles 6 feet 2 inches in width. The division east and west is into five bays with arcades having circular shafts with caps and bases and plain semicircular or slightly stilted arches. Next the walls there are square respond piers with imposts and bases now below the ground. From the caps of the piers and responds there springs a quadripartite vault to each bay, making fifteen in all, and each vault is also separated by plain cross arches running north and south. The vaulting is of rubble and everywhere without ribs, but there are here and there slight indications of ashlar groins. Unfortunately plastering, not of ancient date, denies the satisfaction of structural evidence—not that the vaulting did not originally have a thin skimming coat of plaster; but its renewal has deprived us of visible construction, yet at the west end it does to some extent put in an appearance. The height of the pier caps is 1 foot 7 inches, the shaft 3 feet 1 inch, and the base 1 foot 2 inches. From the top of the base to the underside of the crown of the vault is 9 feet 3 inches.

At the west end of the crypt is a central doorway which led to a small dark chamber about 8 feet long by 7 feet wide. From the aisle at this end there are also doorways, now built up (but left visible through a grating in each), which opened on to passages leading to steps which reached the floor level of the nave.

At the east end there is now a central opening which at one time served as a doorway, and although there is something of original appearance about this work it is not safe to class it as such, as the chamfered edges of the jambs, and the four-centred soffit of the head, and the disturbance of the adjoining vaulting declare themselves above a whisper. One or three altars may have stood at this end where a very small one-light window is placed to each division.

In the north wall there is a central opening which led to a winding staircase between the chancel and crypt. On the south side there is now an external entrance from the churchyard, but on the inside of the chancel wall there is indication of an original doorway which, it has been suggested, points to there having been here a corresponding staircase on this side to that on the north. If this were the case there were originally two entrances to the crypt from the nave, and two from the chancel, all internal. East and west of the south entrance there are two very small semicircular-headed windows with broad splays inside, as have the two windows at the east end. The original windows on the north side have been blocked up by later buildings and their ashlar quoins have been pillaged for use elsewhere.

The external walls are 4 feet 6 inches in thickness, and are built with rubble facings internal and external, with as little ashlar work as possible. The shafts to the piers are 13 inches in diameter, and their bases spread to 1 foot 10 inches square, and the abaci measure 1 foot 11 inches square. All the arches between the piers are 12 inches in width and have a face 5 inches deep. The important features of the structure, such as piers and arches, and quoins to the internal splays to the windows and dressings of the doorways, are most carefully built in tooled stone with close joints. At various places in the piers and responds there are square sinkings carefully cut, which may indicate the use of screens or other provisions for facilitating order in the case of occasional visits of numbers to the crypt, and in furtherance of the object of the two staircases from the nave of the church.

As to the purposes for which these underground structures were designed it has happened that amongst my papers have turned up quite lately a tracing of a careful plan of this crypt, with a description in Latin which would seem to have been produced some 200 years ago, and is to this effect:—"Ground plan of vault of Grimbald." (1) Crypt beneath the church (stretching a considerable distance, it is commonly believed as far as Wolvercote), in which we believe the bones of Grimbald were interred. (2) Eight pillars on two of which (one marked with the letters A. B. C., the other with the letter D.) are seen rude figures. (3) South door or ancient entrance from the south. (4) East door or ancient and public entrance from the east. (5) A very old flight of steps by which access was obtained not only to the vestry or presbytery, but also to the roof of the church where once it is said a bell was hung in a turret. On the same subject of crypts Viollet-le-Duc has written, "the first crypts or grottos of saints had been cut in the rock, or built in the ground to hide from the eyes of the profane the tombs of martyrs." And Mr. J. H. Parker has said in connection with the crypt at St. Peter's in the East that he had little doubt that the central recess under the steps of the chancel was built to receive, and did receive, some shrine or reliquary, and served as a place of security, the marks of the lock being still visible. On certain occasions it was customary for the people to pay honour to this relic and the shrine was brought out on those particular days into the centre of the crypt to be exhibited to the worshippers who passed down one aisle, across at the east end in front of the altar where they made their offerings, and returned by the other side of the crypt. What were the precise relics in this case? Mr. Parker for various reasons suggests that a portion of St. Peter's chain was the object kept in the recess, enclosed of course in some costly shrine. Some of a practical turn of mind, of course tinged with modern ideas, have suggested they were built for the purpose of securing dryness to their superstructures. In none of the earlier crypts does anything now exist indicating their exact use. But in the case both of Ripon and Hexham they could only be lighted artificially, and that would seem to point to occasional visitations only. In all the others the provision of one or more altars seems to be certain, and that would imply services for worshippers.

Between the opinions of Viollet-le-Duc and Mr. Parker the real origin would seem to lie, certainly in reference to the earliest examples. But the vast structures to be seen at Canterbury, Winchester, Worcester, Rochester and Gloucester certainly do seem to imply a large provision for congregations and services. In fact that of the multiplication of altars and the attendance of worshippers. With regard to the uses of the crypt of St. Peter's in the East it may be said that its comparatively large area was in all probability for the congregation of worshippers, and its western recess for shrine, relics, or saintly tomb.

Lastly, with regard to the architecture of this little obscure vault. It may be said, whether its construction or its art be looked at, that every part of it is admirable. It has served its purpose and has sustained the chancel above it for not less than 800 years, and is still structurally sound. In architectural character it is altogether satisfactory to the eye, in its varied divisions, proportions and ornamentation, every stroke of which comes of its natural construction, nothing added, nothing stuck on—all in perfect harmony with the characteristics of its style.

New College.

After the crypt of St. Peter's in the East had been inspected, a move was made to New College, the building of which marked such an important stage in the development of the College plan. Here an admirable account was given by Mr. L. Wickham Legg, M.A., Fellow of the College, an account which would have been remarkable if only for the clearness with which it was given. New College, he said, was founded in 1379 by William of Wykeham, who carried out a scheme larger than anything of the sort which had been attempted up to that time in Oxford. Its official name was the college of St. Mary Winton; it received the name of "New" probably from the fact that it was new compared with the only college which had any really big buildings, viz., Merton. The buildings were on a new system for they had the chapel, the hall, the warden's lodgings, the library and the living rooms of most account grouped round a quadrangle. This was an application of the prevailing monastic arrangement to educational purposes. In the original design the front quadrangle consisted of ranges of buildings two storeys in height, and, except for the addition of a third storey, it is now practically in the condition in which William of Wykeham left it. The third storey was added in the seventeenth century, the work commencing with the insertion of attics in the sloping roof, which still remain in one portion of it. Mr. Legg thought the appearance must have been very like that of Chamber Court, Winchester. About 1590 the present top storey with its crenellated top was completed, thereby destroying the general proportions of the quadrangle, more especially by dwarfing the tower of the warden's lodging. In the seventeenth century the present garden quad was added, this work being completed in 1684. It is believed that the architect borrowed his design from the very effective quadrangle at Versailles. The college remained in this condition until the authorities acquired in the nineteenth century a piece of land outside the city wall which had bounded Wykeham's site to the north. There were erected on this site what Mr. Legg described as the ugly New Buildings from the designs of Sir Gilbert Scott; and these were followed by further additions at the end of last century. The chapel and the hall

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form the north side of Wykeham's quadrangle. The latter is the oldest hall in Oxford; the walls with their windows are as the founder left them. The panelling round the walls is believed to have been given by Archbishop Warham, the last Archbishop of Canterbury before the Reformation; it is noteworthy for its linen pattern. The roof is quite modern. At the end of the eighteenth century the old roof being found insecure, Wyatt replaced it with an ordinary ceiling, lowering it 10 feet when doing so. About the middle of last century the existing fine roof was put up from the design of Sir Gilbert Scott; the stained glass is of the same date. The pictures in the hall are, with the exception of recent portraits, copies.

After Mr. Legg had given the general history of the college and particularly of the hall, Mr. W. H. St. John Hope described the splendid crozier formerly used by William of Wykeham, which with other college plate was displayed on a table. The college is also fortunate in possessing the remains of his mitre, which together with other relics are kept in the warden's lodgings. Mr. Hope likewise gave an explanation of the extent to which William of Wykeham may be credited with personally initiating and fixing the plan of an Oxford college, to which there is nothing corresponding in Cambridge. Before he became Bishop of Winchester, said Mr. Hope, Wykeham was in the king's service as clerk of the works at Windsor Castle. One of the things he did there was to build the belfry of the former chapel; this belfry still stands and is used in connection with the military knights. It corresponds to the detached Bell Tower standing to the west of New College chapel. The buildings on the north side at Windsor began to be remodelled while he was paymaster there, and he laid out two quadrangular blocks, one of them having a cloister—again corresponding to the arrangement at New College. The Great Hall and the King's Chapel were also built end to end precisely as at Oxford. Consequently at Windsor there are to be found all the buildings in the founder's plan of New College; that is to say William of Wykeham derived his inspiration from the works carried out at Windsor. Mr. Hope said he had advisedly described him as clerk of the works for the reason that Wykeham was not an architect in our sense of the word. In the existing patent for his appointment he is called "clericus operum," it being merely his duty to see the workmen were paid regularly. The real architect was the master mason, William of Winford. Unfortunately the accounts were not arranged as in earlier times, from which it is possible to pick out the names of the masons and the various people employed. At Windsor the work was organised in a manner similar to the modern contract. The question of the identity of the clerk of works with the work itself was an important one. William of Wykeham's predecessors and successors in office at Windsor were clerks of works and canons also; but no one ever claims for them that they were great architects. Later on Geoffrey Chaucer was put in charge of the works of repair on the Chapel of the Garter. But, said Mr. Hope, Wykeham was no more an architect than was Chaucer; nor was he the originator of this very commonsense plan. Mr. Hope thought it was quite possible he brought the architect at Windsor Castle along with him to Oxford.

The party left the hall and walked to the chapel, with which it is in perfect alignment. This was the pioneer of all the college chapels having a transept or nave of two bays or ante-chapel. It was erected in 1383. The purpose of this ante-chapel was, as explained by Mr. Aymer Vallance, probably to give accommodation for more altars than would be afforded by the customary choir. Mr. Wickham Legg pointed out the various dates to which the structure and the fittings belonged. Not much of the founder's actual structure is visible. In the reign of Elizabeth the original reredos against the east wall was hacked to pieces, and what was left was plastered over. Wyatt at the end of the eighteenth century took away the seventeenth-century work and erected in plaster the present screen which covers the entire wall. He maintained that there were sufficient remains to guide him; but Mr. Legg doubted whether he had any other guide than the original partitions between the niches which had been built into the cloister. The existing screen was executed in stonework under the supervision of Sir Gilbert Scott and Pearson. The history of the choir roof is similar to that of the hall. The founder's roof was removed by Wyatt and replaced by a plaster one of lower pitch. When this was in its turn removed by Scott a great discussion arose as to whether it should be rebuilt at its original pitch. In the end this was done. In the process of the renovations Scott raised the height of the canopy over the seats, with the result that the legends at the foot of the windows are now blocked out. The glass in the windows on the south side is Flemish, and said to be by Rubens; that in the north is from York. The ante-chapel contains brasses and windows of interest. Some of the windows contain fourteenth-century stained glass which was taken out by order of Queen Elizabeth and was afterwards replaced. The pieces were in such confusion that in 1899 the College employed an expert to put together again the fragments as far as possible. The large west window contains the famous glass decorated with a subject by Sir Joshua Reynolds. When it was introduced in the eighteenth century the original tracery was taken out where necessary so as to suit the design.

On Thursday afternoon the colleges visited were Wadham (see *The Architect*, October 23, 1908), Trinity (*The Architect*, August 7, 1908), and All Souls (*The Architect*, June 3, 1910).

A pause was made at the garden front of All Souls College to listen to an account by Mr. H. Redfern, F.R.I.B.A., of the way in which he and his workmen are repairing the decayed surface of the stone work. He described the process as being similar to that employed by a dentist for the stopping of a decayed tooth. They found when the creeper had been removed that the state of the stone was very bad indeed in places, the corbels of one of the oriel windows were broken through, and other damage had been done. The original stone had been obtained from the local quarries at Headington. This appears to have been at first of a good quality; but as the demand increased the stone was taken from inferior strata. In addition it often happened, as at St. John's, that it was not laid with regard to its proper bed. As a consequence of this, as well as owing to the injurious atmospheric conditions, the greater number of old Oxford buildings are to-day scarcely ever entirely free from scaffolding. Mr. Redfern said the decayed parts on the garden front were first cut out; this had to be done most carefully as the building would not stand hammering. When the sound stone was reached the surface was covered by a frontal wall of hand-made roofing tiles bonded into it, which were fixed and faced with lias lime. The broken corbels under the oriel window were drilled through from front to back in situ and copper bolts inserted. The whole surface was finally repeatedly coated with baryta water. The colour, which is not at first in harmony with old work, is expected to become like it in from five to ten years. This process enables Mr. Redfern to claim that not a single stone has been removed and not a single new one inserted.

(*To be concluded.*)

ILLUSTRATIONS.

DESIGN FOR REREDOS IN OPUS SECTILE.

THIS design by Mr. WILLIAM GLASBY is to be executed in Opus Sectile, a very suitable method for decoration in a church where painting is apt to suffer from damp and temperature variation.

INTERIOR OF HALL, FULBOURN MANOR.

THIS drawing illustrates the interior of the hall of the house by Mr. DUDLEY NEWMAN, of which views were given in *The Architect* of December 3, 1909.

ST. PETER'S CHURCH, HORNSEY.

THIS church was designed by the late Mr. JAMES BROOKS, and the fittings now illustrated have been recently added from the designs of Mr. J. STANDEN ADKINS, the sole surviving partner of the firm of Messrs. BROOKS, SON & ADKINS.

PASCHAL CANDLESTICK, ST. JOHN BAPTIST CHURCH, KENSINGTON.

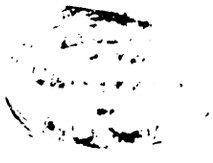
THE Paschal Candlestick was dedicated last Easter for the church of St. John Baptist, Kensington, and was designed by Mr. J. STANDEN ADKINS.

INTIMATION has been made that under the testamentary deed of the late Mr. George Roberts, of Whitelee, Gala Water, and Dandswall, Selkirk, 1,000*l.*, free of legacy duty, has been bequeathed to the trustees and managers of Heatherlie Parish Church, Selkirk, one-half to go towards the fund for the erection of a church hall, and the other half to be devoted to the organ endowment fund.

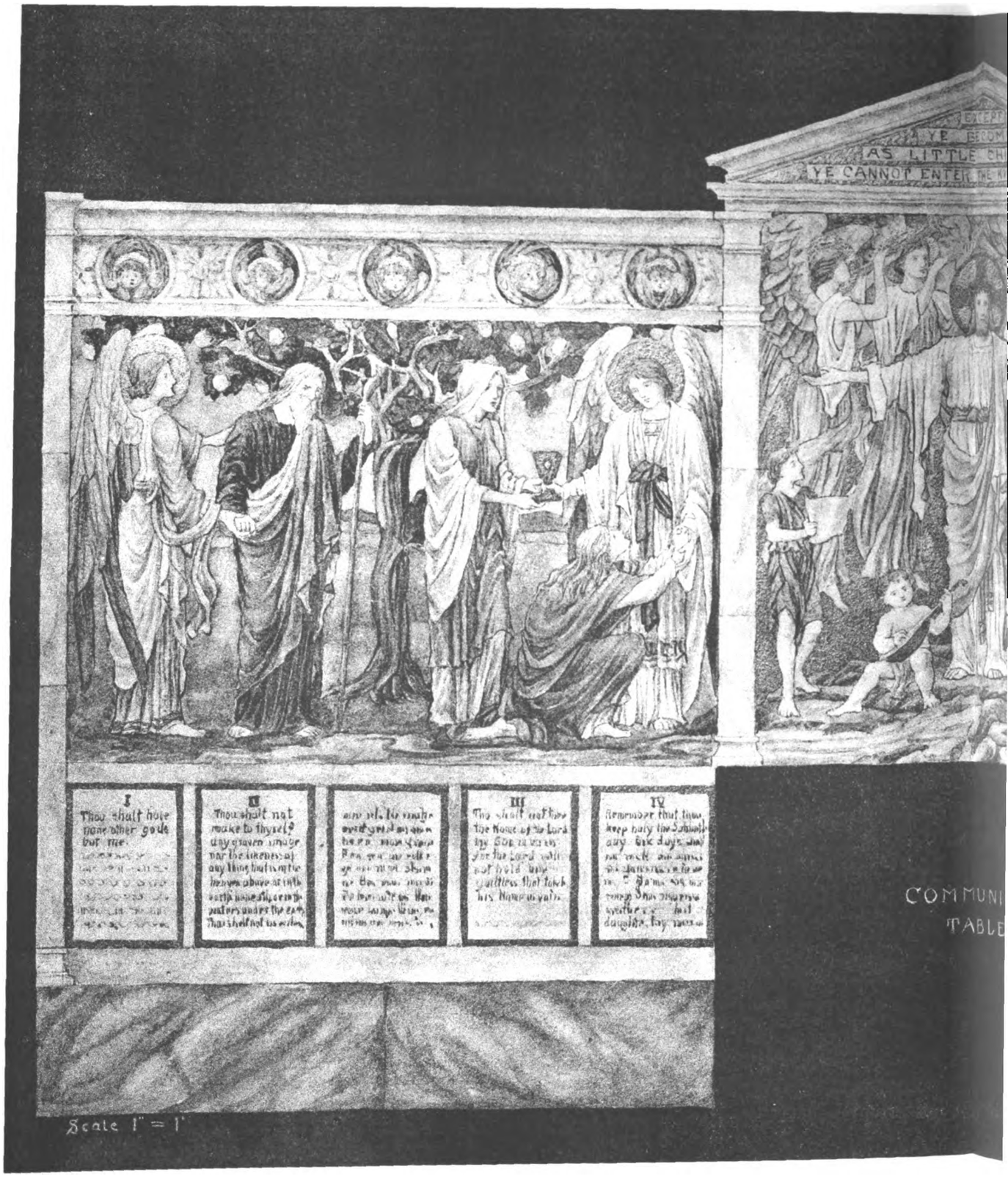
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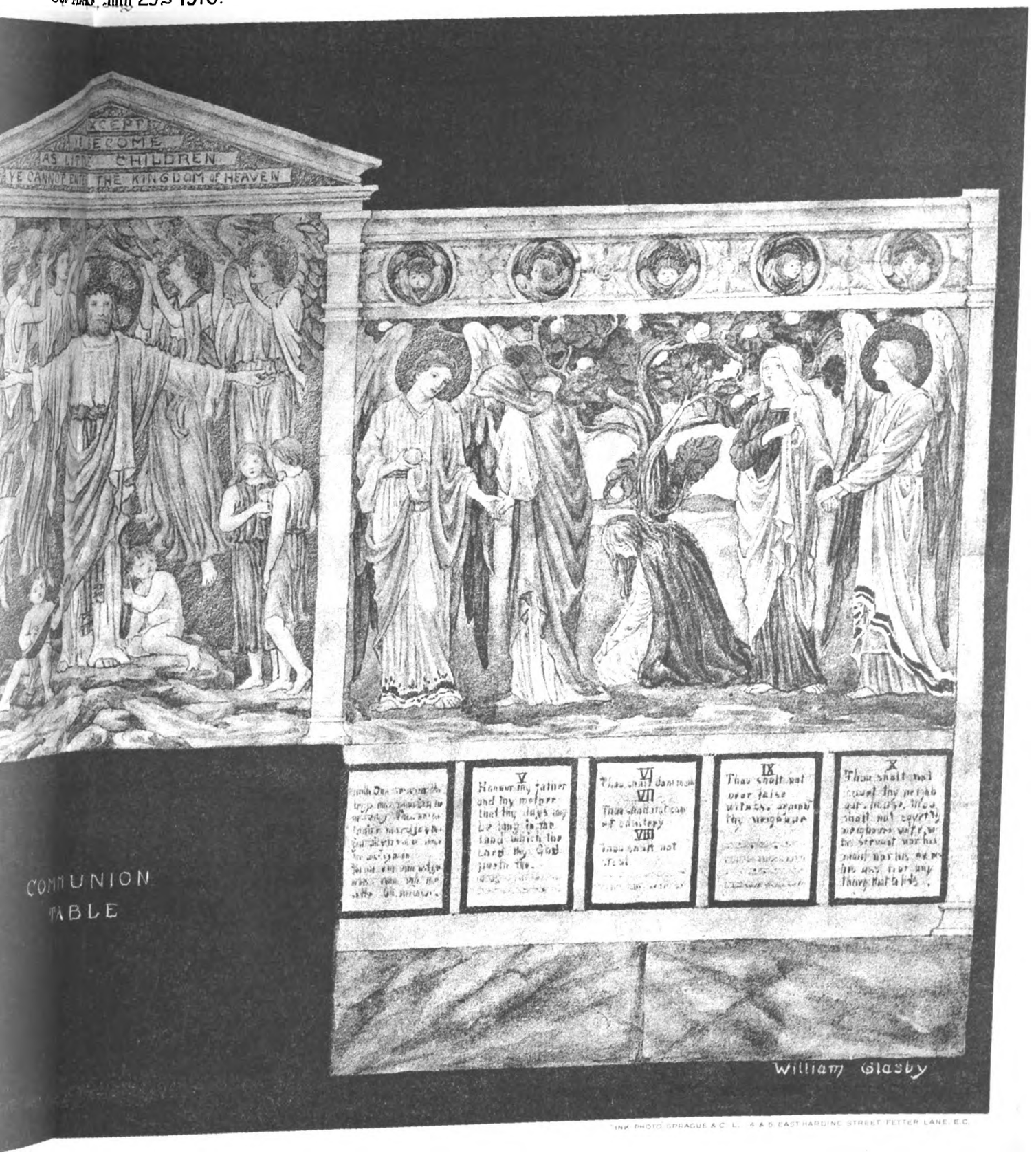


DESIGN FOR REREDOS IN

By Mr. WILLIAM GL

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The Artist, July 29th 1910.



INK PHOTO SPRAGUE & C° L.D. 4 & 5 EASTHARDING STREET FETTER LANE, E.C.

OR REREDOS IN OPUS SECTILE.

By Mr WILLIAM GLASBY.

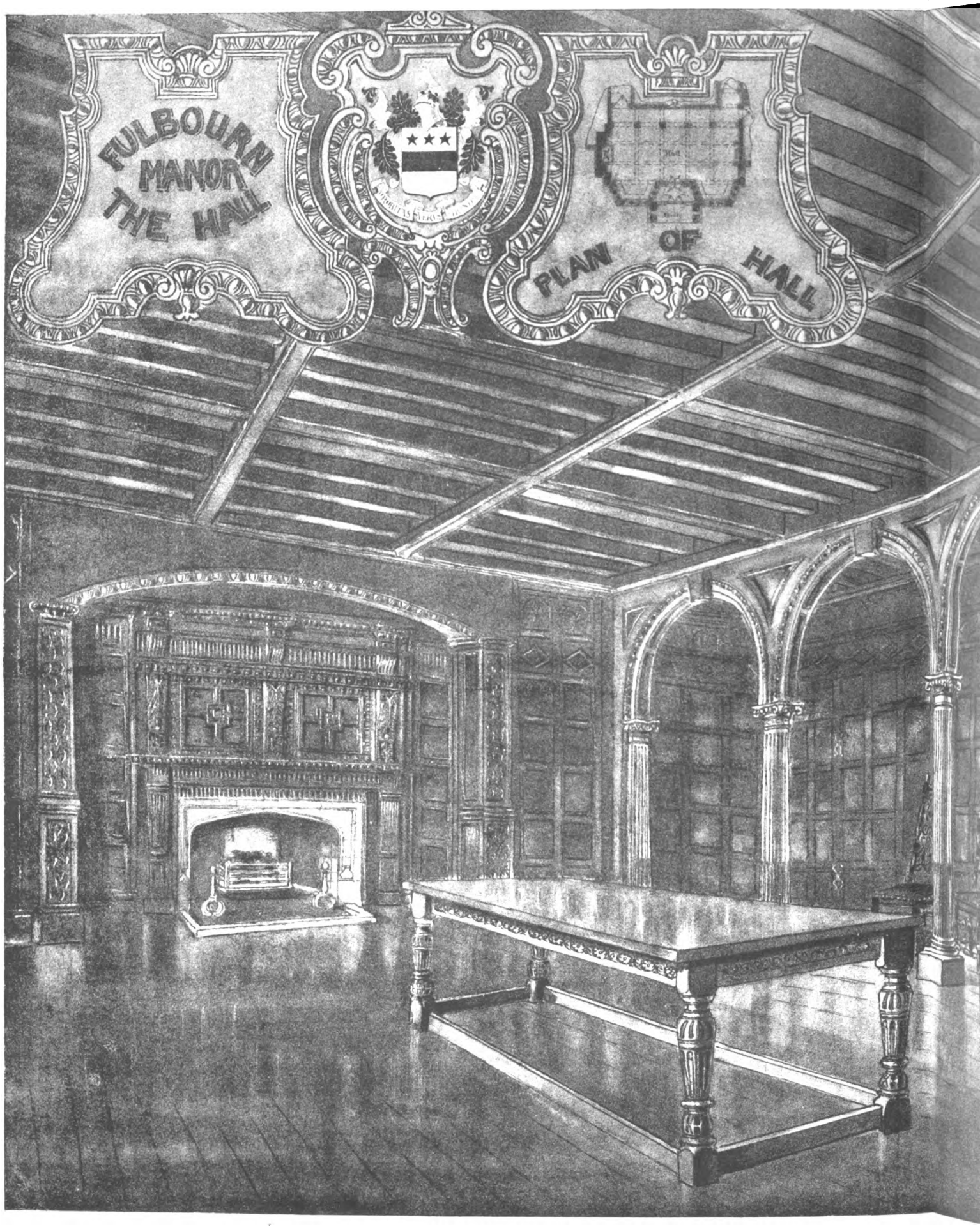
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INTERIOR OF THE HALL FULBOURN

Mr. DUDLEY NEWMAN, F.R.I.B.A., Arch

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INK PHOTO CO. PRAGUE & C. L. 4 & 5 EASTHARDING STREET FETTER LANE E.C.

THE HALL, FULBOURN MANOR.

LEY NEWMAN, F.R.I.B.A., Architect.

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CHURCH OF S. PETER, HORNSEY: STALLS, SCREEN, CORONA AND CANDLESTICK.

Messrs. JAS. BROOKS, SON & ADKINS, Architects.

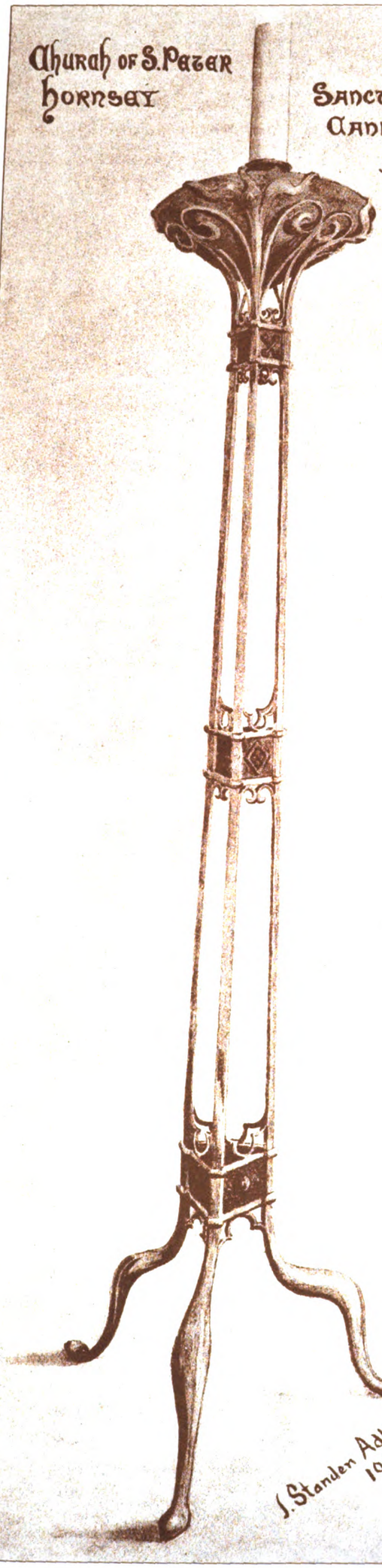
The Architect, July 29th 1910.

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Church of S. Peter Hornsey

Sanctuary Candlestick

Jas Brooks Son & Adkins Archts

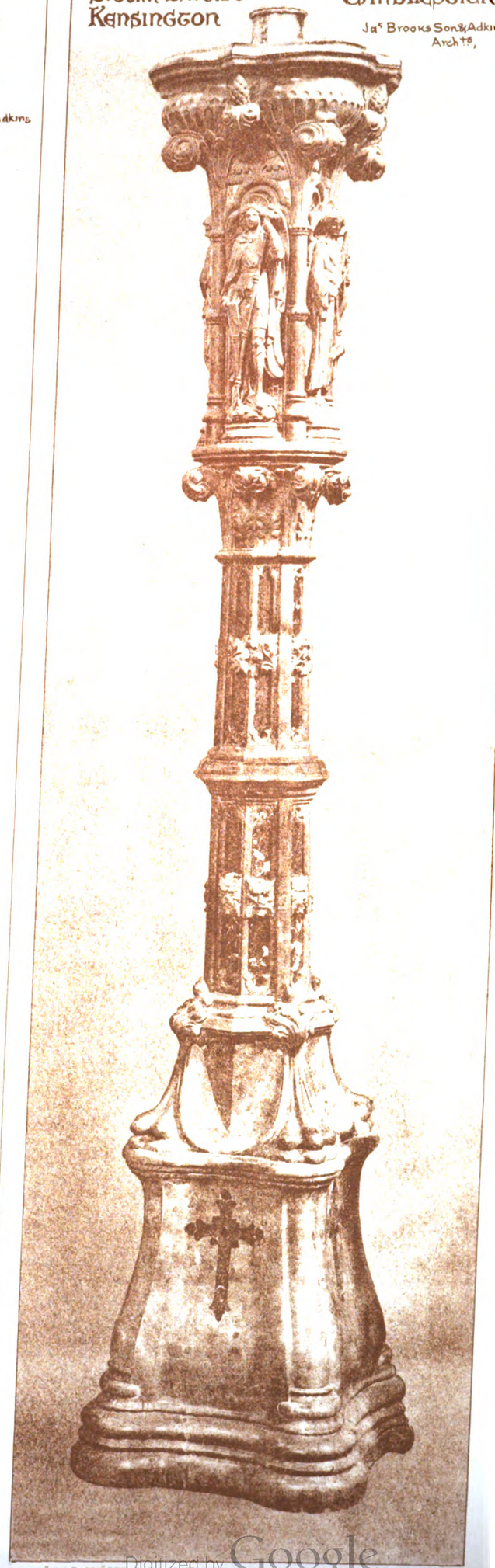


J. Standen Adkins 1910

Church of S. John Baptist Kensington

Paschal Candlestick

Jas Brooks Son & Adkins Archts,



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HORNSEY: STALLS, SCREEN, CORONA AND CANDLESTICK.
Messrs. JAS. BROOKS, SON & ADKINS, Architects

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WHEN the Paris Exhibition of 1900 was opened it was said that it was the greatest the world has ever seen. The one that was opened on Saturday, April 23, in state by the King and Queen of the Belgians, in the presence of the Burgomaster and representatives of every important country, is certainly a very near approach to it, and one can hardly realise as we pass out of the beautiful Bois de la Cambre and see before us the building of the grand façade with its terraces and beautiful fountains, behind which tower solid-built buildings of brick, that such a town, which practically it is, should only be there for a few months. For example, the building which represents Brazil, with its columns and dome, surrounded with beautiful palm trees, is one to be remembered. The large and charmingly constructed house representing the Netherlands, of brick and stone, entered by a bridge, is a museum in itself. But although colossal in size as the buildings are, they are arranged in such a perfectly artistic way that one does not clash with another, but makes a perfectly harmonious picture for the eye. The "Netherlands," although standing practically not more than about 50 yards from the building that represents Germany, is only divided off by a garden; but that garden is laid out after the old Dutch ones, with its walks and terraces and old gateways. The Exhibition at Brussels is, as it ought to be, a huge modern museum, if one may use the word "museum" in speaking of a modern collection of exhibits. The German building has an exhibit of machinery that ranks certainly on level terms with our own, and the lace (referring to the machine-made material) is alone worth a visit to those who are interested in machine-made furnishing fabrics, and it points out to those whose business it is how much that country has done to compete with others who make a speciality in that line alone. Nothing seems to have been forgotten to show each section at its best.

In the British section the ceiling is draped with a sort of white muslin that has a cloudlike appearance, making the statue modelled by Mr. BROCK, R.A., stand out strongly against it, and standing guard, as it were, over that special section. Mention may be made of the way in which the foreign sections have treated the ceilings of their exhibits. The top is concave and is decorated in such a way as to form part of the room, but the whole is transparent as one would treat glass, and thus light comes through.

Respecting periods or styles there seems to be a great demand for the Georgian, for the number of firms that have designed their rooms in that style is great. Of course, in France it was Louis XIV., as one can see at a glance when visiting the chapel of Versailles, and afterwards our St. Paul's Cathedral with GRINLING GIBBONS's carvings in wood, &c. One often wonders why that period which produced the lovely works of GIBBONS was not in the past more universally used in England than it has been, for not only is it a style that gives great scope to the artist both in wood or stone, but it lends itself so completely to the solid cabinet work of the English craftsman. But, like a good many other things in this life, what we objected to at a past period of our lives we often prefer afterwards; and so it has been with the so-called Georgian period. The name Georgian, we think, is somewhat of a mistake, because it is apt to mislead the everyday person, who takes for granted what he hears or sees without inquiring more into it. For example, Adams is Georgian, but it does not represent the style that is meant by the word. But Georgian need not necessarily be Adams. CHARLES II., ANNE, and GEORGE I. are the periods which the so-called "Georgian" style represents.

But that prejudice against introducing figures which has hitherto existed seems to be dying away, for not only are they used both for exterior work as well as interior, but all the details of the ornamental—corn, ropes, draperies, &c.—so well known in that style. And now these beautiful carvings have been so well copied that it is certainly very difficult to tell the new from the old. For example, Messrs. WHITE, ALLOM & Co. have original carvings on each side of an oak mantlepiece and over the door. Messrs. WARING & GILLOW have carving also in that style, and for detail, breadth of work, and perfect undercut it is difficult to tell the modern from the old; even the carvings in the same room that Messrs. WHITE, ALLOM & Co. have executed next and actually side by side as it were with the original work of GIBBONS are difficult to separate as to which is the old and which the new. Then, again, one cannot deform the figure in the same way as one can an arrangement of flowers without it being at once noticed. The head of a child, the wings so perfectly carved in the original, and the extreme relief that is required, must be well drawn and carved, otherwise the work is practically useless. In the sketches of Messrs. WARING & GILLOW's work are shown a Georgian room in oak and gold.

The pilasters are richly carved and touched up with gold both on the scrolls and on the foliage. The mouldings round the doors are exquisitely carved and gilt, and on the relief where the carving stands out gold is also introduced. On the ribs of the pilasters it is also used. The salon decorations are of old gold on a green ground, richly moulded in relief. The chimney-piece, partly of grey marble and partly of oak, has a painting in the centre, and is surrounded with carvings in very high relief, having below a panel carved in the well-known style of that period.

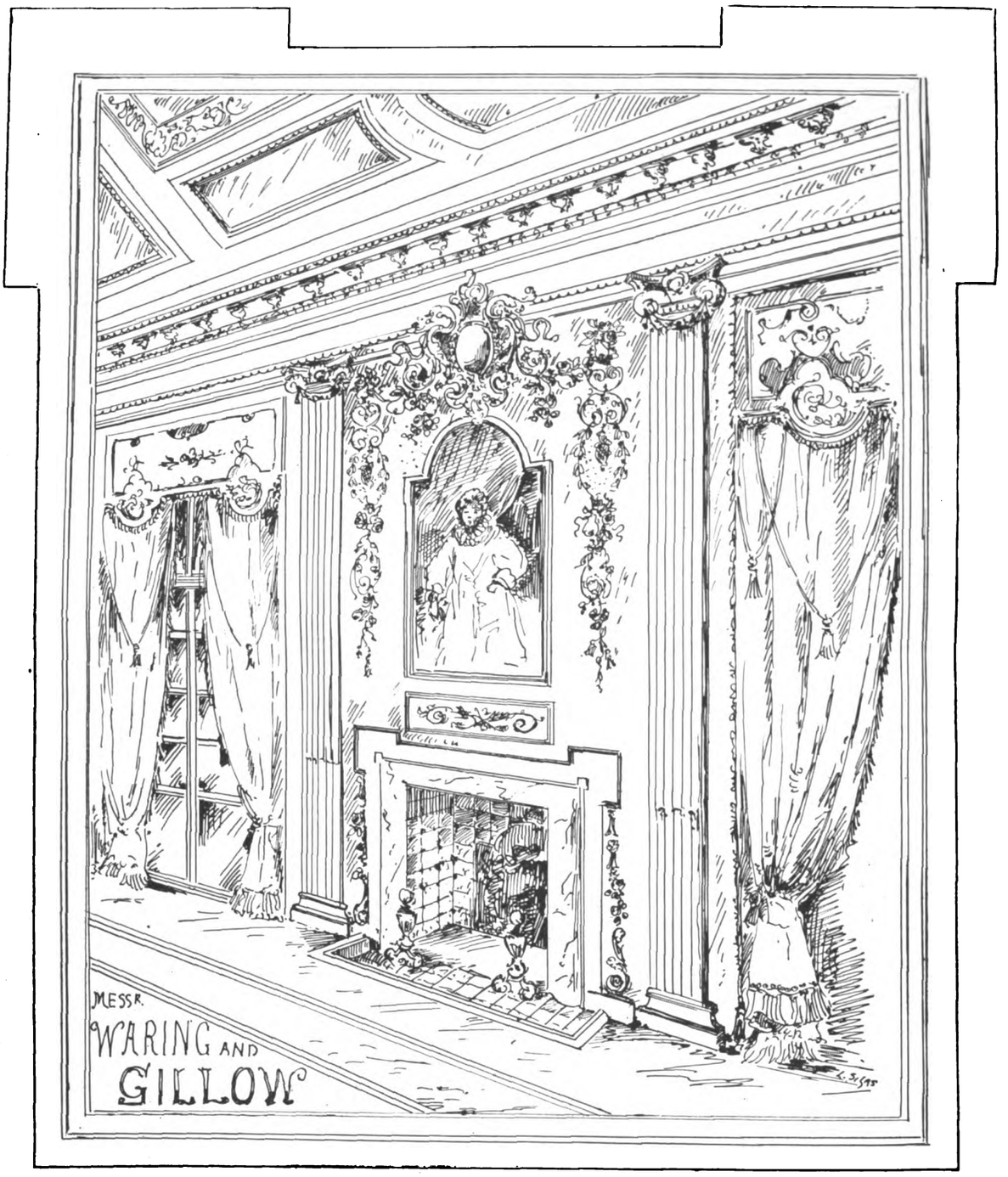
A quite unique arrangement has been introduced outside the semi-circular window, with its square glass panels —namely, a landscape painted on a back cloth to represent an old garden; this, having a light arranged at the base of the sill at the back, has a very fine effect. Outside

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the room the walls have been treated in the old style, with wood beams and panels, the door having the Royal arms carved in a panel at the top.

Messrs. COWTAN & SONS show a room with Chippendale furniture, Japanese painted paper on the walls, and Georgian style ceiling, &c. But not the so-called Chippendale style—a mixture of bad Adams and Sheraton—but the real period—namely, Louis XV. and Chinese—that time when the lacquers were so beautifully executed by craftsmen both in China and England.

The large dining-room that they are showing is of a very pale green grey, almost white, on the floor of which is a Savonne wool carpet of a harmonious tone of green. The mantlepiece is moulded and carved with columns and pilasters, and mounted with very richly carved caps, and inlaid with Sienna and deep green marbles. Anyone with half a glance can see what care the carver has taken to produce each part, however small, perfectly. This room has eight columns in it, all richly carved at the top. At the end of the room are two china vitrines let



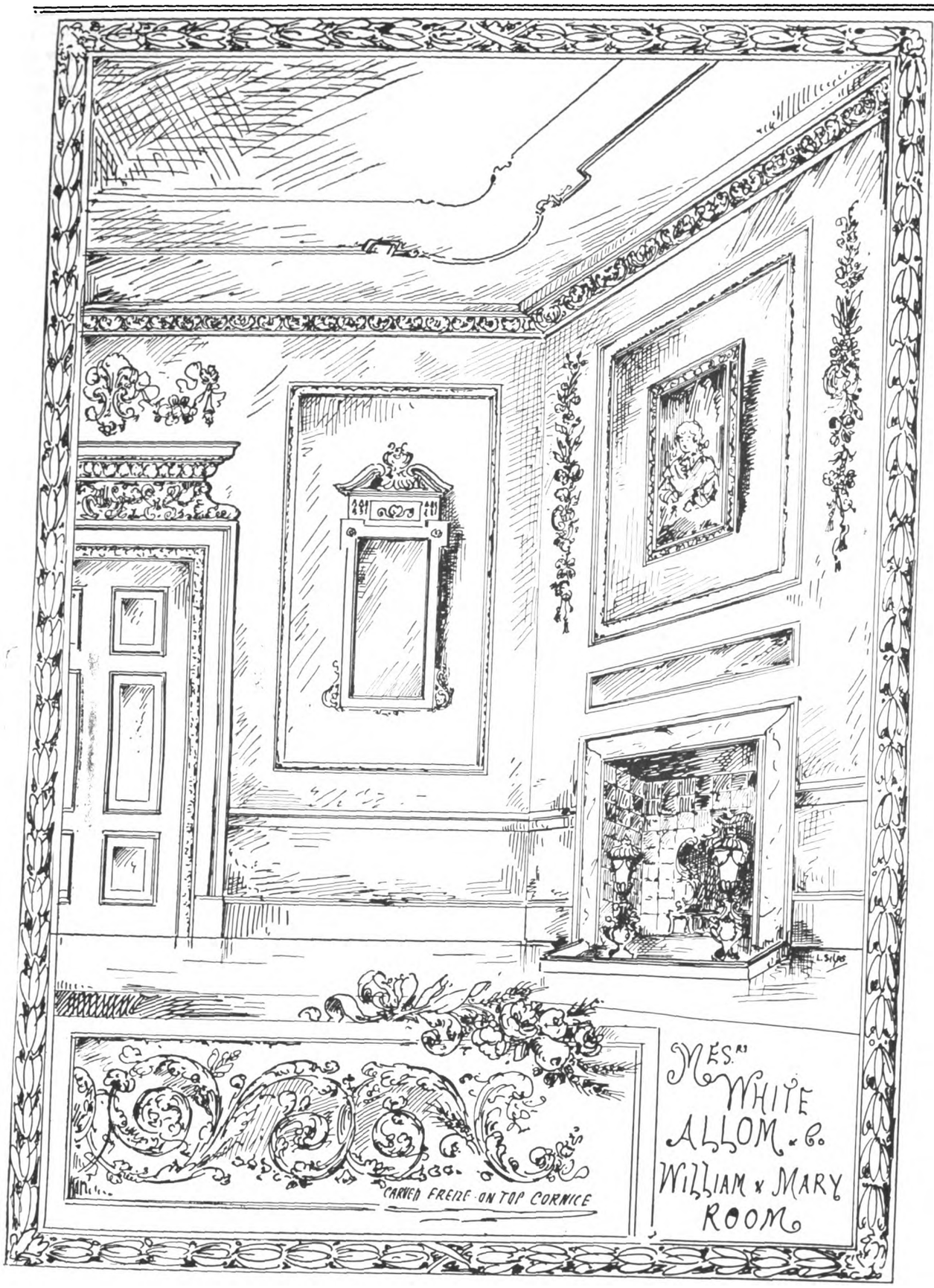
One has only to look at the work of the cabinet that Messrs. COWTAN have designed and made for china to see what pains this firm has taken to reproduce that bygone style so little used now.

Messrs. HOWARD & SONS also show a room in the Georgian style, with pilasters carved, and headed at the top by Cupid's head and wings.

The sketch of the William and Mary room is from Messrs. WHITE, ALLOM & Co.'s exhibit. They have a drawing-room in the Chippendale style, with carvings both on the dado as well as the frieze, green damask being hung on the walls.

into the wall, in the centre of which is a large looking-glass, with a gilt table having bracket legs at each side, moulded with goats' heads at the top and richly carved centre gilt and toned. It would be as well to note that each piece of furniture, although of the same period, is different in design, with the exception of the pieces that are in pairs, as, for example, the two side-tables with their quaint scrolls at the top of the legs. In the centre of the room stands a large oval table with old English cut glass upon it and a large bowl in the centre of flowers set as it were for dessert. Outside the rooms the walls are all of oak panelled in the old English style.

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The William and Mary morning-room is of oak and gold, with deep mulberry and green curtains of velvet, the furniture being of walnut, gilt and toned in different places. The carvings which form pendants each side of the mantlepiece are the original carvings of GRINLING GIBBONS, also the panel over the door, the other carvings being executed in their own workshops to match, and, as has been explained before, these are very difficult to distinguish one from the other. A fine glass hangs on the wall, which is gilt lacquered.

The Royal Wilton Carpet Works show some good samples of British carpets, the one with the red ground and circular in shape being especially rich in colour.

Textile fabrics are represented by London and provincial firms and manufacturers. Messrs. WARD & Co. show a fabric in the Henry II. style, unique in design. Messrs. WARNER & SONS also have their usual fine showcase of high-class fabrics, and have very finely executed work in furnishing silks, amongst which is the white Angel Georgian silk designed by Mr. L. F. SILAS, now in

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MESSRS. GILL & REIGATE'S EXHIBIT AT BRUSSELS EXHIBITION.

the museum at Nottingham Castle, each etching that was on the design being beautifully executed on white silk. To describe the exhibition at Brussels would take many books, but one would like to mention that those visiting it should not miss seeing the model of the Hôtel de Ville, which has been executed in hundreds of diamonds, the windows being of rubies, an apotheosis of clap-trap.

GAS HEATING RESEARCH.*

(Continued from last week.)

EXPERIMENT No. 8.—The stove had horizontal iron frets. Much has been said on the subject of the superiority of the old iron-fret stoves as radiating appliances. All the experiments and determinations that have been made in the course of this inquiry go to show that although the iron-fret stove is equal to the fire-clay type, still it is no better, and the advantages the latter have from the point of view of appearance and cleanliness—having no oxide dust—make it much to be preferred. Again, on first lighting the stove, there is more likelihood of the escape of carbon monoxide from the iron-fret stove than in the fire-clay "fuel" stove, owing to the much higher conductivity of the iron than that of fire-clay preventing the iron from warming up as quickly as the fire-clay.

The stove used in Experiment No. 9 had identically the same arrangement of horizontal iron frets, but the construction of the body of the stove was very different. Extending from the foot of the stove was a tray or fender projection, and at the top of the stove there was a canopy acting as part of an arrangement for extracting the heat from the waste products of combustion. Both these projections cut off radiant heat which would otherwise have come into the room.

Experiment No. 10.—This stove was of massive construction, and the iron frets were in a vertical position in the form of iron sprays lying against the flames, one side of which touched the iron frets and the other side the small knobs of fire-bricks with which the whole of the back of the fire was studded. There were nc gas and air adjustments in any of the iron-fret stoves. It would have been an advantage to have had them. The large upper body of this stove cut down the flue heat loss so much that it was with difficulty that a sufficient draught could be maintained up the main chimney.

Experiment No. 11.—The reflector stove consists of a number of long luminous flames, which burn horizontally inside the top of the stove. The heat and light from these flames are reflected by means of a curved copper reflector into the room.

Experiment No. 12.—The fire in this stove consisted of a number of perforated cylindrical tubes of fire-clay, each resting over a small non-luminous flame. The gas and air adjustment was elaborate, but easy to operate; but some difficulty was experienced in getting the correct adjustment to ensure the highest radiant efficiency with this stove.

Experiments Nos. 13 to 18 are experiments with stoves already reported on, but having fuels specially treated as described in another part of this report.

The Incandescent Mantle Stove.—This stove is of quite a new type, and is still in the experimental stage. It was submitted by the designer to the Gas Heating Research Committee for their examination. Its main principle is the utilising the heat passing from an incandescent gas light by absorbing it in the cast-iron frame work of the body of the stove. At the same time the air passing in at the foot of the burner is preheated by passing through the stove. The body of the stove was found to be very efficient in taking up the heat from the products. At the end of three hours the surface of the stove and the flue gases attained their maximum temperature, the latter being 81° C. Good combustion does not take place until a sufficient draught is set up in the flue, but was generally satisfactory at the end of 1½ hours.

* Abstract from second report of the "Gas Heating Research Committee" appointed by the Institution of Gas Engineers in conjunction with the University of Leeds.

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The stove was covered with polished copper sheeting, which prevented radiation from the body of the stove, the heat passing from it as convected heat. The average flue heat loss at the end of three hours was 9.5 per cent. The heat radiated from the mantle and passing through the glass chimney was 21 per cent., the remaining 69.5 per cent. being taken up by the stove and glass chimney, and passing away as convected heat. There were no arrangements provided for the reception of the water condensed in the stove.

The object in constructing the stove appeared to be to find a more efficient substitute for the so-called "gas-radiator."

General Remarks on the above Tests.

There is great divergence in the figures in column K, showing flue heat loss. This is entirely due to variations in the construction of the top of the stove and to the size, shape, and position of the outlet from the stove into the flue. No fan was used in any of these experiments for abstracting flue gases.

It would not be possible to state, even if it were permissible to do so, that any one make of stove stood out above all others as a type of what should be. There are a number of very good makes each differing materially in details. Where one stove has an advantage in one respect, it falls short in another.

In all probability the highest efficiency attainable with the present type of open fire, where the air of the room has free access to the front of the hot fuel, will be little more than 50 per cent.

There are four sources of heat loss from the fuels:—

1. By radiation in all directions.
2. By conduction to the air in contact with the front of the fuels.
3. By conduction to the back and sides of the stove.
4. By the convection of the waste products passing away from the top of the fuels.

The first of these is the one it is desired to increase. To do this, some or all of the other channels must be cut down.

The waste products always leave the "fuel" at a slightly higher temperature than that of the top of the fuel, so that the higher the temperature of the fuel the greater the heat loss in the waste products. If the temperature of the main body of the fuel is raised, the loss by conduction to the air (2) and to the fire-brick back and body of the stove is increased. In many stoves in which the whole of the fuel is usually maintained incandescent, it would add to their efficiencies to increase the length of the "fuels"; for although the added fuel would not be incandescent, and would not radiate as much as the rest of the fuel, it would take up some of the heat of the waste products and conserve the heat of the "fuel" below it.

A better radiating material seems to be the only means by which the radiant efficiency of the stove might possibly be increased. But even with this the temperature of the material would be lower, owing to its having radiated more heat; and as the amount of radiation varies approximately as the fourth power of the temperature, it is doubtful whether there would be any great increase in radiation efficiency by employing a better radiating material, the gas consumption remaining the same.

Although it appears that with the present type of stove the radiant efficiency will not be increased much beyond the 50 per cent., there is no reason why the heat usually allowed to pass up the flue should not be utilised more than has been the case. It is, of course, not practicable to cool the products below a certain point, as a definite percentage of heat is necessary to maintain the flow of the products of combustion up the flue. This amount will vary with the height and construction of the flue.

Radiation from Bunsen and Luminous Flames.

The point of most importance in the study of the principles underlying the working of a gas-stove of the radiating type is the convenient and economical generation of the requisite amount of heat and the transference of the heat of combustion to the "radiating material" employed. In this connection, the question of the amount of heat the flame itself radiates is worthy of consideration.

It is stated by Professor H. L. Callendar that the heat radiated from an ordinary non-luminous Bunsen flame might amount to 15 or 20 per cent. of the total heat of combustion, but that it depended on the duration of incandescence. It is further suggested that the larger the flame—whether due to increased gas consumption or to a decrease in the air supply—the greater is the percentage radiation. This is explained as being due to the increase in the mean temperature of the flame.

The results of the following experiments agree quite well with those obtained by Professor Callendar.

There were four sets of experiments, a Mèker burner being used in the first. This had a deep nickel grid, and was 3 c.m. in diameter. No estimation was made of the relative proportions of air and gas entering the burner. There were small cones at each perforation in the grating. These were about one millimetre high, and the flame was noiseless, steady, and quite conical. Its height was approximately 210 mm. The gas consumption was measured by means of a standardised wet meter, account being taken of temperature and pressure at the meter.

The gas rate, reduced to 60° Fahr. and 30 inches of mercury, was 7.12 cubic feet per hour, and the calorific value 132.2 calories net. In this case, the flame radiated 14.9 per cent. of its heat. This was checked immediately afterwards, in order that similar conditions could be maintained, and the same result was obtained.

The second set of experiments were with a large type of Bunsen burner with a wire gauze taking the place of the nickel grid. The gas consumption was 8.9 cubic feet per hour, and the calorific value of the gas 137 calories net at 60° Fahr., 30 inches, wet. The width of the foot of the flame was 35 mm., and at the middle 40 mm. The mean height of the flame was 180 mm., and the mean height of the inner cone was 70 mm. This was distinct but not sharp, and the flame could be heard, but there was no spluttering, and it was not noisy. This was about the type of flame in respect to its aeration usually found in a gas-stove, although its volume was much greater. The mean of a number of experiments, which were practically constant in their results, showed that 15.2 per cent. of the heat was radiated from this type of flame.

(To be continued.)

COMPETITIONS.

EDINBURGH.—USHER HALL.—Sir Aston Webb, C.B., R.A., has, with the co-operation of Mr. J. A. Williamson, city architect of Edinburgh, awarded the first place to the design of Messrs. Stockdale Harrison & Sons, with Mr. Howard H. Thomson; the second place and premium of 250*l.* to Mr. F. W. Simon, F.R.I.B.A.; the third place and premium of 150*l.* to Mr. H. E. Clifford, of Glasgow; and the fourth place with premium of 100*l.* to Mr. William Heywood, of Birmingham.

LIVERPOOL.—The Liverpool Garden Suburb Tenants, Ltd., on the recommendation of their chairman, Mr. Henry Vivian, M.P., have arranged to promote amongst the students of the Department of Civic Design in the School of Architecture, Liverpool, a competition for the laying out of the estate of 180 acres which they have purchased at Childwall for a garden suburb, and offer 50*l.* in prizes. Should a design be submitted of sufficient merit, they undertake to carry it out either entirely or in part. The competition is to be held during the ensuing session. They also offer a competition among the students of the School of Architecture for a street or square of cottages, which, if satisfactory, they propose to erect, and to pay the author of the chosen design at the rate of 2½ per cent. commission.

MIDDLESBROUGH.—Messrs. T. Mellard Reade & Son, the assessors, have made their award in the competition for the Archibald Council school to be built in Ayresome Green Lane, and of the sixteen designs submitted have placed the following in order of merit:—1, Messrs. Clark & Moscrop; 2, Mr. J. Forbes; 3, Messrs. Kitching & Lee; 4, Messrs. Clark & Moscrop; 5, Mr. J. Forbes; 6, Messrs. J. M. Bottomley & Welburn; 7, Mr. Haslock. The estimated cost of the design selected is 14,150*l.*, or just over 6*d.* per cube foot. The Middlesbrough education committee has confirmed the recommendation of their building committee to adopt the award of the assessors.

A VISIT TO THE EXHIBITION AT SHEPHERD'S BUSH.

By NANKIPOO.

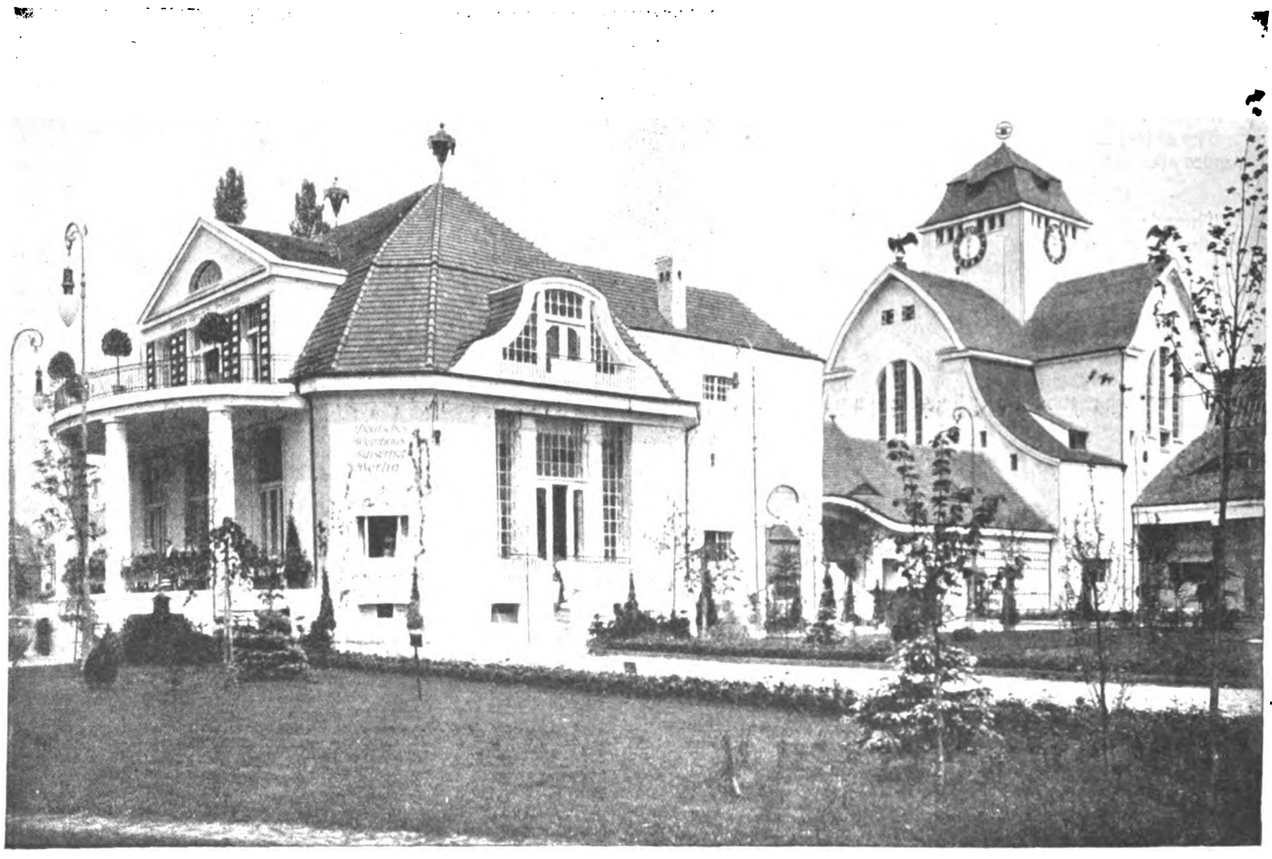
WHEN the honourable editor said to me, "Go ahead and tell us what you saw at the Exhibition that would differentiate it from any one preceding," I, his unworthy shadow, felt embarrassed with my riches; for is not Japan—the rising luminary of the Far East—like unto no other known country in its commingling of ancient and modern, of Eastern and Western? It is very well for Mr. Kipling to affirm that "East is East and West is West, but never the two shall meet," but he should have made an exception in favour of Japan.

I was about to speak when my companion continued:—

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MODERN EUROPEAN ARCHITECTURE.

BELGIUM.



[From *Moderne Bauformen.*

GERMANY'S BUILDINGS AT THE BRUSSELS EXHIBITION.—Professor EMANUEL VON SEIDL, Architect.

"Understand, we do not wish to listen to a similar strain of absurdity such as our special commissioner to the Franco-British Exhibition indulged in. However, 'De mortuis nil nisi bonum'; what we want is a plain unvarnished easy, we might say Japan-easy, account." I might not dispute with my Mikado, but I could not help reflecting that it would be difficult to unvarnish japan.

Entering the Exhibition from the high road, it is a pleasure to observe the successful means adopted to attract the public to the initial series of galleries, and to cause visitors to linger and admire what they saw, instead of merely traversing the Crystal Halls as if the latter were merely corridors leading to the Exhibition proper. The Japanese have converted some of these galleries into tableaux representing the Four Seasons; in this attractive diorama Japanese painstaking labour is to be seen at its best. If I record my preference for the representations of Winter and Spring, it must be regarded as being merely indicative of my personal taste. To indulge in one slight criticism, a suggestion may be offered to diminish to a degree the gloom (the more than gloom) in parts; the public have no desire to break their legs or necks for the sake of satisfying artistic effect; the evil days of Louis XIV., when his courtiers are said to have perished of symmetry, do not demand resurrection. But after uttering this criticism, it is only right to revert to the delightful disposal of rustic dwellings, bridges, stepping-blocks, meandering streams, torpid and flowering shrubs, and over all and through all the season's atmospheric effects.

Our allies exhibit some educative drawings and models of buildings—amongst others of prisons; that at Nara is planned mostly on the "solitary confinement" system, whilst at Miyagi there is a liberal admixture of associated and solitary cells. In both establishments the radiating plan for cell-blocks is favoured.

In passing along these Crystal Halls a model occupying a large area is to be noted exhibiting the Itsukushima shrine. This model is the work of a famous (Japanese) modern architect, Koresuke Takahashi, who received a subsidy from his Government for the services that he was considered to have rendered to the cause of architectural science by reason of his labours on this model. In the course of a lengthy explanatory tablet the pious wish is offered to Takahashi that "we hope you will keep your health and finish it (*i.e.* the model) successfully." The shrine consists of the sacred island with the buildings upon it—a palace, a pagoda, and other erections; and human and animal representations help to give an air of reality.

When inspection is made of the Far Eastern section of the Fine Art Palace one idea is forcibly driven home, and that is, that whilst our trusty allies have much to learn from us in the treatment of the human figure, they can teach us much in regard to decorative ornament. This is as it should be between friends. There are some passably good portraits, and an oil-painting of chrysanthemums represents the zenith of flower-painting; however, extended notice of the work in this medium is not desirable. But the Japanese rice-paper pictures showing landscapes and bird-life are mostly admirable, and there is a vigorous study, too, of tigers; it is, indeed, exhilarating to look at the latter, seeing how pronounced is the presence of Lyons at Shepherd's Bush.

It is remarkable how backward is Japan respecting the portrayal of the human form and facial expression. There is a similar sense of caricature—or it might be termed of unreality—such as some of our own artists exhibited; men like Rowlandson and (may it be whispered?) Cruikshank. But with us this effect of unreality (even this word is not sufficiently expressive; it would be better to use or coin the word "unrealness"), this "unrealness" is limited to a few artists—amongst the Japanese it is prevalent; and not only amongst them, the Chinese have a similar faultiness, the old Egyptians also, whereas the Assyrians more faithfully depicted contemporary mankind.

We trust that our allies will not regard us as narrow-minded (we may not say insular) in this expression of opinion.

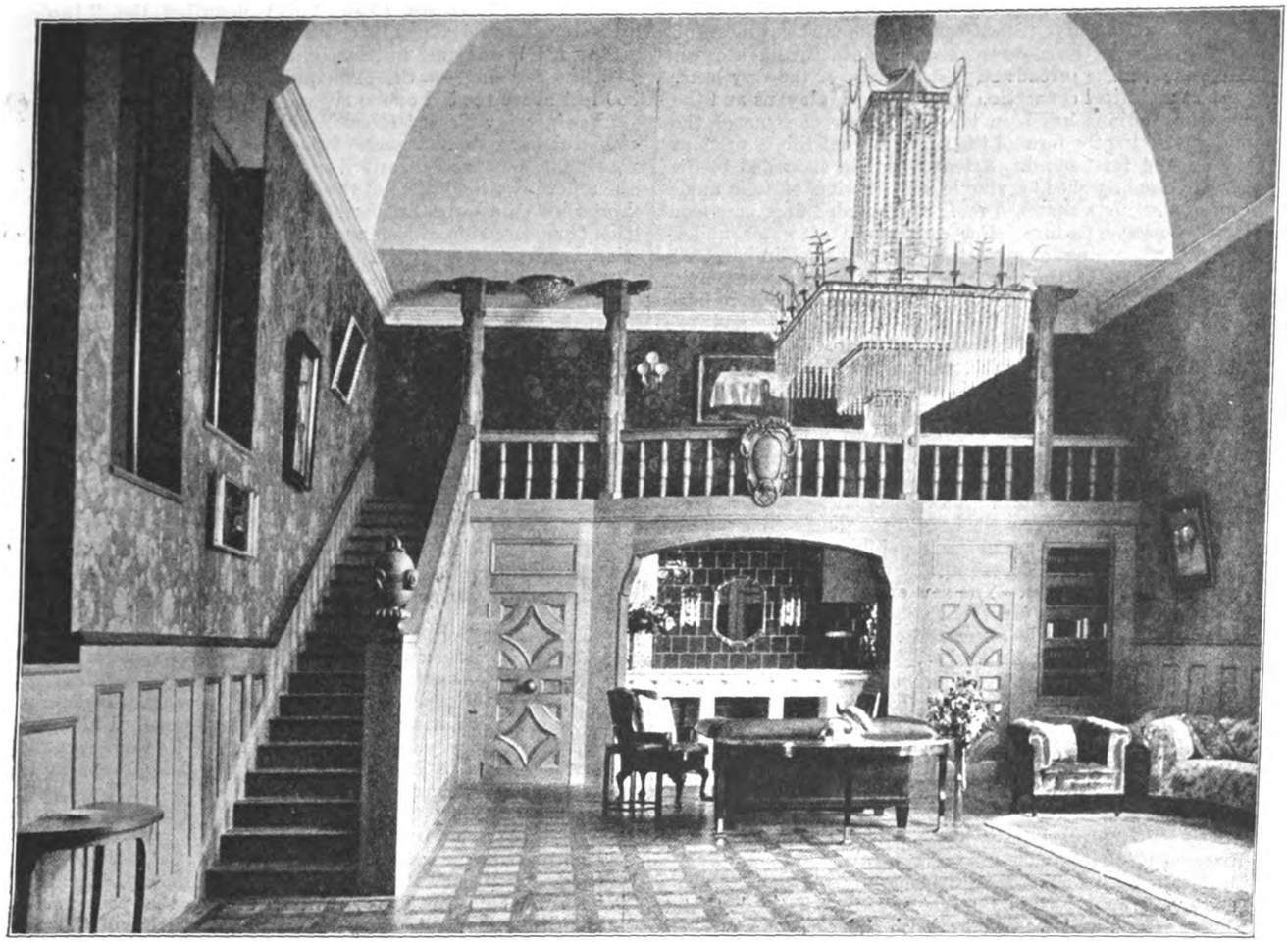
In sculpture and carving there is plenty of good work to be seen, and especial attention may be directed to a carved wood panel in alto-relievo, the subject being a flock of sheep. The decorative screens, fabrics, and other objects are worthy of close inspection.

In a magazine such as this the claims of architecture must not be entirely disregarded; and in the Fine Art Palace

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MODERN EUROPEAN ARCHITECTURE.

BELGIUM.



[From *Moderne Bauformen.*

RECEPTION-ROOM OF THE GERMAN PAVILION AT THE BRUSSELS EXHIBITION.—Professor EMANUEL VON SEIDL, Architect.

are numerous models of Japanese buildings. In fact, models are characteristic displays throughout the Exhibition. In the way of drawings, three large strainers show a design by Mr. Iida Tokusaburo for a Japanese gentleman's modern residence; doubtless it is suitable for Japan, though, not unnaturally, this building and others shown do not appeal to English tastes. Respecting the last, however, the design for the new headquarters at Tokyo of the Red Cross Society of Japan might issue from London, though, as a matter of fact, the architect is Dr. Y. Tsumaki. This drawing, and a model of a second-class Post Office, are exhibited in the hall devoted to the Japanese Government. In that occupied by the Departments of Education and Industry is shown, amongst other objects of greater or less interest, a full-size model of a drawing-room, which does not appeal to our Far Western tastes.

Bazaar exhibits do not call for notice here, except to the extent of remarking that they are largely in evidence; but in this respect one country is as great a sinner (if any crime is involved) as any other country.

But the distinctive features in the Exhibition demanding notice here are the native villages. The Ainu Home is a collection of huts erected by Ainu natives, the aboriginal inhabitants of Japan, and now fast becoming extinct, for there are only about 17,000 remaining. As the natives will not intermarry, except in their own tribe, the result is a natural decadence. Those now at Shepherd's Bush are distinctly pleasing as types, the belle of the tribe and the champion bear-hunter being amongst the number. The lady is remarkably attractive, in spite of the curious tribal custom of tattooing round the two lips, the arms, and the hands. These aborigines are no longer idol-worshippers, but their totem is the bear. The huts are well-built, and being native work, may be supposed to characterise the dwellings in the Far East. They are constructed from the top downwards, the skeleton included, after the preliminary erection of two or three main or guiding poles. The thatching is of bamboo fibre, and is well executed, completely covering the walls and roofs externally. Within a boarded ceiling is used, following the planes of the span roof. There is a small opening on each wall for light, and the entrance to the hut is low-crowned. The hearth for the fire is placed centrally, or approximately so, on the floor area. It is distinctly pleasing to wander through the Ainu village and to observe the intelligence depicted on the native countenance, the tribe seeming of a superior caste to those from Senegal and Ceylon that may be recalled in connection with the Exhibition of 1908; superior also to the aboriginal Malayans who occupy the Formosan stra (village) a short distance away.

In passing to the consideration of the latter, it may be noted that the Chinese use the word tung in place of stra. The island itself is known topographically as Taiwan, and is about the size of Ireland; in the Exhibition hall known as the Orient Palace there is an interesting model of Formosa. The architecture—or perhaps it would be correct to limit the following remarks to the construction independent of the art—the constructive qualities are not on a level with those exhibited by the Ainu natives; here there seems, indeed, to be a want of studied construction, and the walls, made of rough balks and dried mud, look uncouth and unscientific, and contrast unfavourably with the all-over thatch hitherto referred to, nor is the former likely to prove less verminous than the latter. Within the method of roofing (it cannot be called ceiling) is interesting—bamboo square lattice-work, allowing the roof-thatch (straw being more used for the purpose than bamboo fibre) to show through the interstices. Special openings for light are conspicuous by their absence, the low-crowned entrance serving for all purposes apparently, except that in the Exhibition huts electric light is installed with a most incongruous effect. Many and varied are the forms employed for the dwellings, the favoured one being polygonal, though in the malarial districts an elevated hut is in vogue, being raised several feet from the ground on lofty poles, the intercommunication being by means of a portable ladder. I recall reading, as a lad, a book entitled "In the Eastern Seas," and one of the illustrations that

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most powerfully impressed me was that showing the Malayan elevated dwelling. It has been left from then till now—shall I say a matter of half a century?—well, not quite—for me to see the real hut, though even now not on its native heath. Bamboo is the wood commonly employed by the Formosans, and the Exhibition authorities find the awkwardness of this when the natives, desirous of manufacturing a fresh tobacco-pipe, make inroads on the structure of the very huts.

An ethnological connection between the Malayans and the American Indians has been traced in view of some of the dwellings taking the form of the wigwam; but this is perhaps fanciful and far-fetched. Attention might be called to the open-air dancing shed, a simple construction of four angle posts supporting a thatched roof; the boarded floor here seen is not a native feature. For conveyance of water underground bamboo pipes of respectable diameter are in use.

Before quitting the stra, mention may be made of the curious marital loving-cups, deftly carved out of a hard wood, and having a wide stem with hand-holes and two bowls, one each for the husband and wife. In loving conjunction they imbibe the sakè, and get drunk in unison.

In "Poetic Japan"—to give the enclosure its Exhibition title—there are shown in a series of thatched sheds various industries and activities; I will refer to a few only. The cabinet-worker was employed in making drawers out of green and very knotty wood; it was interesting to observe the manipulation of the plane, the craftsman working it homewards and not away from the body, as is the English method. The cabinet work was by no means admirable, and the position in which the nails were finally driven home left an uncomfortable impression. The saw employed is double-edged. Metal-working (with very rough tools), sword-making, and other industries may be also watched with interest.

. . . . . .

Here I noticed that the editor was fidgeting in his chair and looking furtively at the clock, so I endeavoured to hasten my discourse before he should get in a word:—Of course, I visited some of the relaxative side-shows, such as the Wrestler, the Wonder-workers, the. . . . It was no use, the editor would have his say. "But, my dear M——, that is, Nankipoo! have you nothing to tell us about the British exhibits?" I replied, "Sir, you objected to our dear dead friend's all-British remarks in 1908, so I thought it advisable to restore the balance by restricting my notice to our ally's show." However, this I might say, that I think that the Press is not well treated by Pooh-Bah, the Commissioner-General; the representatives of the Fourth Estate of the Realm are to all appearances regarded by him as an unnecessary evil. Were it not for the greater sanity and courtesy of various distributed officials the task of gaining material for an article would be rendered much more difficult. The *entrée* to the sections behind barriers is grudged by the Lord Pooh-Bah, and notes are not supposed to be made; also . . . But here the editor courteously but firmly put his veto on my continuance, so I retired with a graceful salaam.

Note by the Editor.—We think Mr. Nankipoo might have had something to tell us about the English exhibits; for though, as we understand, there are several features remaining over from previous Exhibitions, yet we are told that the London County Council has taken a vast amount of trouble in getting together an exhibit, attractive alike to architects and the general public, not the least interesting being an ⅛-inch scale model of the Holborn-Strand improvement (showing the newly-erected buildings) and a museum collection of architectural details removed from various old London buildings.

OUR CONTEMPORARIES FROM OVER-SEAS.

"LA CONSTRUCTION MODERNE" (Paris) gives an abstract of some of the epigrammatic sayings of M. Auguste Rodin, the great sculptor, at an after-dinner speech on the occasion of his being fêted by some of his friends and admirers in honour of his promotion to the rank of Grand Officer of the Legion of Honour. The subject of M. Rodin's speech was the cathedral of Chartres. Our contemporary's illustrations are of a picturesque villa at Pierrefonds, of which MM. Emile Thion & Paul Grotsch are the architects.

Moderne Bauformen (Stuttgart) issues this month a magnificent series of illustrations of the buildings and their furnishing and decoration by which Germany is represented at the Brussels International Exhibition, a complete exposition of the high character of the present position of the "new art" movement in Germany, and justifying, in our opinion, our contemporary's prediction, "Der Tag ist nahe, da Deutschland eine moderne Kunst haben wird, würdig, des Reiches Kraft und seine wachsende Grösse auszudrücken." We give this week two reduced reproductions from our contemporary's current issue as specimens of modern European architecture.

Scientific American (New York) describes the "two highest masonry bridges in the world," and illustrates the bridge at Constantine, in Algeria, in course of construction, with the centring for the principal arch 230 feet span and 330 feet above the bed of the river.

Engineering Record (New York) contains an account of some further tests of models of the Medina aqueduct arch in continuation of those described on March 5 last. Of interest is the report of a committee of the American Society for Testing Materials on a large number of paints used for the preservation from corrosion of iron and steel. An illustrated description is given of a typical steel-frame structure, the Curtis Building, Philadelphia; also of the foundation work of the twenty-five storey municipal building in New York. "Repeated and eccentric load tests of reinforced concrete columns" is a paper read before the American Society for Testing Materials, by Mr. M. O. Withey.

Correspondence.

[The Editor will not be responsible for the opinions expressed by Correspondents.]

A National Memorial to Edward VII.

SIR,—Perhaps in most details your correspondent, Mr. Percy Marks, is correct, although I must say that the suggestions of "Waterloo" did particularly appeal to me from the fact that Charing Cross Hospital is so cramped for room that the only possible extension would be by taking in the Westminster Eye Hospital. The suggested improvement to Buckingham Palace is, I consider, however, a far better national tribute; the front view of the Palace as it now stands has long been an eyesore and disgrace to London architecture. Might I be permitted to congratulate you, sir, without any desire to be considered flattering, on certain improvements in *The Architect* during the past twelve months? As what I may term an aged member of the profession, I have been much interested in your Students' Club (thirty-nine years ago, when I was a student, I had no such chance), and in the examples you have been giving us of modern European architecture, as I presume of what to generally avoid in design. I must not further trespass on your space.—Believe me, yours very truly,

A SUBSCRIBER FOR THIRTY YEARS.

SIR,—Mr. Percy Marks is quite correct. What on earth would be the use of pulling down a practically modern building for the sake of erecting it on a site which undoubtedly would be one of the most unsuitable positions in the whole of London? I am sure that "Waterloo" will agree with me when he seriously thinks the matter over.—Your obedient servant,

CHARING CROSS.

P.S.—What a generous tribute from Mr. Ernest Runtz to Neatby. I knew the man, and I agree in every particular with the statements contained in the article; he was a particularly modest man as well.

Curing Smoky Chimneys.

SIR,—Some few months ago I remember reading in the Press a number of letters with suggestions for curing smoky chimneys. I have unfortunately mislaid them, and as I am very much troubled in that respect I should be grateful if any of your correspondents could either put me on the track of the papers in which the correspondence took place and the date, or give me any hints. The chimneys are modern ones in a country house and have a sort of "well" grates—they smoke abominably in all winds. There are trees close to the house, which is situated about a mile from the sea.—Yours, &c.,

NORFOLK.

THE King has been graciously pleased to become patron of the Institution of Civil Engineers, of which Institution he was an honorary member for seventeen years before his accession to the Throne.

H.R.H. PRINCESS LOUISE, DUCHESS OF ARGYLL, has graciously consented to become the patron of the School of Art Wood Carving, South Kensington.

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The Architect.

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FORTHCOMING EVENTS.

Monday, August 8.

A.A. Annual Excursion : Ripon, West Tanfield, Kirklington.

Tuesday, August 9.

A.A. Annual Excursion : Leeds, Ansthorpe Hall, Temple Newsam.

Wednesday, August 10.

A.A. Annual Excursion · York.

Thursday, August 11.

A.A. Annual Excursion : Arthington Nunnery, Harewood.

Friday, August 12.

A.A. Annual Excursion : Fountains Hall and Abbey, Markenfield Hall, Ripley Castle.

STUDENTS' WORK AT THE ROYAL COLLEGE OF ART.

THIS year's exhibition of work by the students of the Royal College of Art, at South Kensington, is as interesting as usual. The school of architecture, to which we first turn our attention, has produced some excellent results, and shows distinctly valuable studies. It must be remembered that this school is not entirely a school for architects, for all students of the Royal College must study architecture in whatever section of art work they propose afterwards to specialise. Hence, no doubt, the importance attached to preliminary studies, which have to be carefully and conscientiously made under the guidance of the instructors before a student is allowed to make a design or attempt to do so. Thus, whether the student has the natural aptitude for becoming an architect or not, he has at least to make a serious study of architecture.

The first term's work, therefore, of the Lower Division includes the studies in architecture not only of those who intend to become architects, but of future painters, modellers, designers of textiles and other manufactures. The studies are good and conscientious; the designs, if not remarkable for power or originality, which could hardly be expected, show an adequate appreciation of the studies without plagiarism. Complete sets of the work of two students only, P. W. Cole and W. G. Newton, are shown. One is therefore entitled to assume that the drawings exhibited show the working of the system in the case of picked students.

The next section of the exhibition is one term's work of the Upper Division first year's course, and embraces the work of those who voluntarily take a second term's course of study in architecture before proceeding to other schools of the college, as well as of those proposing to specialise in the school of architecture. The same system is adopted—preliminary historical studies of the employment of sculpture with architecture preparatory to the design of a sculpture gallery with modelling school. Very remarkable are a series of four full-size measured drawings, by four separate students, of the Caryatide statue from the Erechtheion at the British Museum. Although designs by twenty students are hung on the walls, the preparatory studies of three only are shown. If we did not believe that these are picked students we should be astonished at the ability in the draughtsmanship of figure sculpture displayed by architectural students at the Royal College of Art, and if A. Howell, S. A. Neate, and F. K. Pope were to be architects in the future, they would possess a power of figure drawing superior to that of ninety-nine in every hundred of their co-workers in the Art of Architecture. But we see the name of S. A. Neate in the school of painting and mural decoration. When we turn to the designs we find the architecture not particularly admirable, though fair designs are shown by F. Rainbow, A. O. Dawe, and P. Lloyd. The influence of the preparatory studies is shown by the lavish use of sculpture, as though a sculpture gallery in England would normally display its treasures outside the building. The usual humourist appears in this division of the school, with a Venetian Gothic design for a twentieth-century sculpture gallery.

When we come to the work of the Upper Division of the school of architecture we realise that the system of training for architects is a sound one, given suitable students. The general subject for the session was a design for a new Royal College of Art placed upon a site to be selected by the designer in Kensington Gardens, and the preparatory studies were especially directed to the laying out of public buildings upon their site. The design awarded the travelling studentship is by Mr. T. H. Hughes, and as a piece of planning and composition in the grand manner is superior to anything that exists in London. The building is placed on the east bank of the Long Water, with its main axis aligned with that of the Round Pond, whilst three new roads from the east cross Hyde Park and converge to the entrance. The main block is led up to by lower buildings on each front, making a masterly composition. The design in detail is simple, dignified, and well proportioned. W. T. Benslyn has adopted a similar axis for his building, but has placed it on the west side of the Long Water, and has produced a good design if not quite so impressive as that of the winner of the studentship. W. M. Kelsey has committed an error of judgment in making his Renaissance building form three sides of a quadrangle enclosing the Albert Memorial, with whose aggressive Gothic it would be completely out of harmony. The discord would not be agreeably resolved by the help of the Albert Hall, which the designer brings into his scheme of grouping.

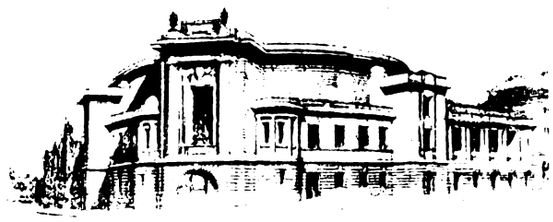
Two designs are shown for the decoration of part of the entrance to Somerset House, of which that by W. R. Dean is superior in its reticent restriction of colour to the vaulting, to the gaudy and bizarre application of inharmonious colour to the walls, by Phyllis Harvey-George.

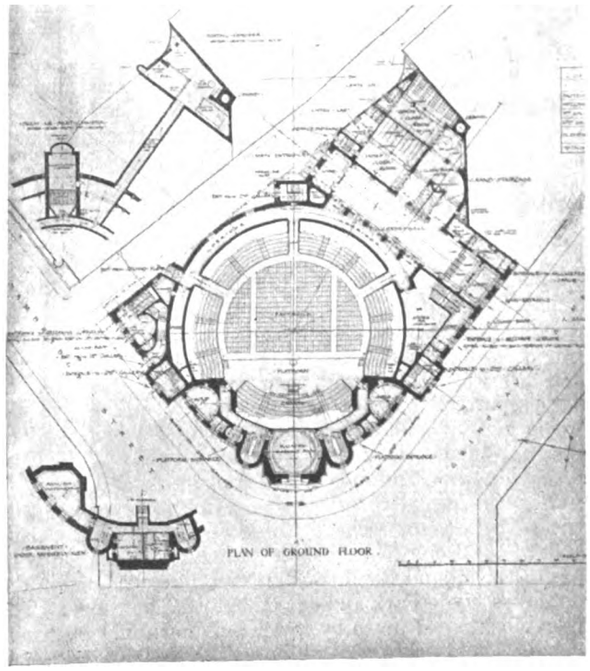
In the school of sculpture and modelling the travelling studentship has been won by Mr. C. S. Jagger, whose design for an entrance door to an art collection is not only admirably modelled but a charming piece of composition with considerable originality. Mr. W. McMillan's design for the same subject is good in modelling, but in its composition suffers from the centrality of the chief points of interest, a fault that Mr. Jagger has cleverly avoided.

The students in the school of painting and mural decoration have devoted their attention to themes from Vasari's "Lives," and Mr. G. H. J. Day wins the tra-

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USHER HALL COMPETITION.

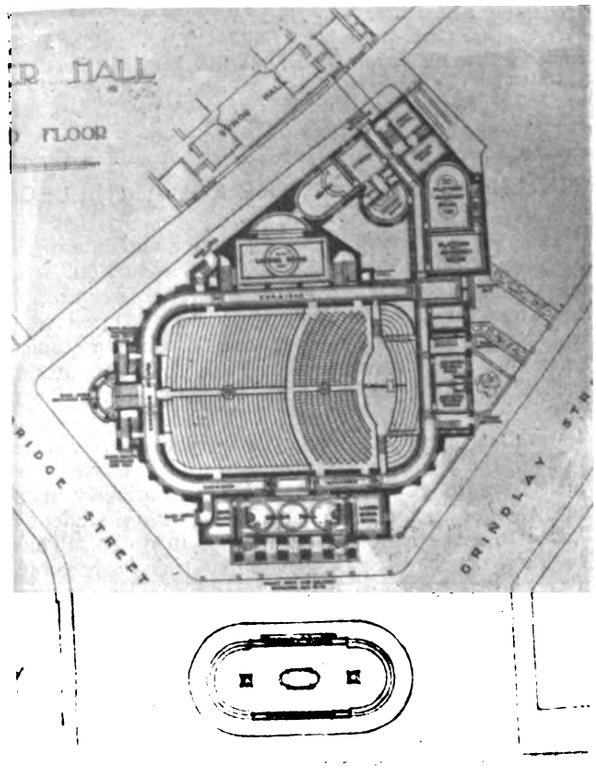




Premiated design (second place) by Mr. F. W. Simon.

USHER HALL COMPETITION.





Premiated design (third place) by Mr. H. E. Clifford.

velling studentship for an excellent set of spirited designs. We were pleased to notice two studies by Mr. E. M. Neatby, who was referred to by Mr. Ernest Runtz in his appreciation of the late W. J. Neatby that appeared in *The Architect* of July 22. The younger Neatby's work gives promise for the future in the breadth of treatment and suitability of idea that marks his rendering of the subjects "Cimabue finds Giotto" and "Donatello criticises Uccello's fresco."

In the school of design the travelling studentship is taken by Mr. N. H. Leaver, whose studies of work in the Museum are, in our opinion, superior to his designs.

NOTES AND COMMENTS.

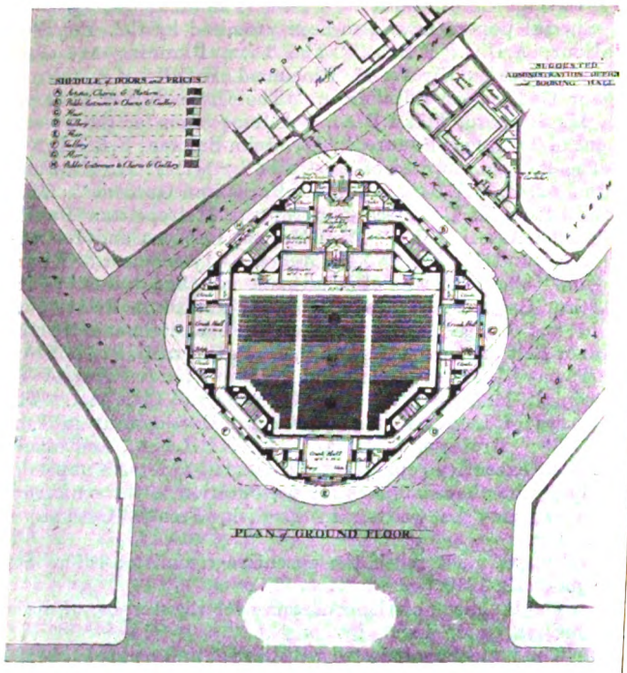
The report that part of the grounds of Holland House may be turned into building land as a result of Mr. Lloyd George's taxation has given rise to some correspondence in the *Times*. On the one hand is virtuous indignation that Lady Ilchester and her family should dare to dream of doing as they like with their own property, and maintaining 70 acres of land in the heart of the West End of London as an open space for their own enjoyment, with only occasional permission to strangers to come in and enjoy it also. Because Holland House has been maintained by its owners for many generations in its ancient form, it is said to be "one of the great historical estates of Great Britain, which ought to be saved to the nation." By this reasoning everybody who has anything that by virtue of its age is antique ought to be dispossessed and forced to sell it to "the nation." We wonder whether those who hold this view have the faintest idea of what the national debt would be if all the historic mansions, pictures, books, furniture and other valuables were bought up by the nation at their bare market value!

It is one of the things for which all British lovers of art and historical monuments of every kind ought to be sincerely grateful that there are private owners who will keep them in British hands instead of selling them to Americans or Germans, as they might readily do, subject to the law of entail, which Socialists would speedily sweep away if a chance arose. The absurdity of the idea that because someone has something exceptionally good he should share it with all and sundry is pointed out by other correspondents. The facilities that are given so freely, under proper and reasonable conditions, by the owners of great and historic mansions for public enjoyment could scarcely be bettered, taking everything into consideration, if they were all turned into national museums.

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USHER HALL COMPETITION.





Premiated design (fourth place) by Mr. William Heywood.

Amongst the many suggestions for memorials to King Edward VII., that of Colonel Cornwallis West, that the Welsh national memorial should take the form of sanatoria in both North and South Wales, seems to us particularly appropriate, granting, of course, that Wales needs sanatoria, and is not yet sufficiently supplied with hospitals of this special character.

The conference organised by the National Housing and Town Planning Council, of which we gave a report last week, dealt with a very serious state of affairs. The possibilities foreshadowed by the Housing and Town Planning Act of 1909 have aroused enthusiasm throughout the country, and it would be a national disaster if that enthusiasm were chilled by official mistakes or strangled with official red-tape. We hope that the President of the Local Government Board, whom we all regard as essentially a level-headed man, will see that the working of his Act is given the fullest scope. Town planning of the right kind demands apparent sacrifices, if not real ones, from landowners, and to handicap local authorities in the operation of the Act of 1909 will put the finishing stroke to any attempt to escape from the hitherto existing principle of estate development—the cramming on the land of as many houses as possible and the creation of the biggest ground-rent.

Amongst the series of lectures at the Cambridge University summer meeting now in progress at York those by the Rev. W. Marshall on English ecclesiastical architecture have to our mind been soundly based on the work in parish churches. Too frequently in treating the subject, comparatively little attention has been paid to the smaller buildings, and most of the illustrations have been drawn from the cathedrals. It is true that the cathedrals provide the most glorious examples of architecture that we possess. But the study of the smaller churches should not be neglected, not only because they are of great interest in themselves, and in many cases of a very high order of design and execution, but because there is impressed upon them much that is characteristic of our Church and country.

The Imperial Copyright Conference has approved the following resolutions, which have been included in a white-paper memorandum of its proceedings:—The Conference recognises the urgent need of a new and uniform law of copyright throughout the Empire, and recommends that an Act dealing with all the essentials of Imperial copyright law should be passed by the Imperial Parliament, and that this Act should be expressed to extend to all the British possessions. The Conference is of opinion that as from the date on which the new Imperial Act takes effect the existing Imperial Copyright Acts should be repealed. That save in so far as it may be extended by Orders in Council, copyright under the new Imperial Act should subsist only in works of which the author is a British subject or a bona-fide resident in one of the parts of the British Empire. That His Majesty should have power to direct by an Order in Council that the benefits of the new Act should be granted to the works of authors of a foreign country first published in that country, conditionally on that country making proper provision for the protection of British subjects entitled to copyright. Copyright should include the sole right to produce or reproduce a work, or any substantial part thereof, in any material whatsoever, and any language; to perform, or in the case of a lecture to deliver in public, and, if unpublished, to publish the work, and should include the sole right to dramatise novels and vice-versa; and to make records by means of which a work may be mechanically performed. The terms of the copyright ought to be based on the life of the author, with the addition of fifty years. No formalities such as registration should be imposed as a condition of the existence or exercise of the rights granted by the new Act. An original work of art should not lose the protection of artistic copyright because it consists of, or is embodied in, a work of architecture or craftsmanship, but it should be clearly understood that such protection is confined to its artistic form, and does not extend to the processes or methods of production.

We are glad to know that a Memorial Committee has been formed for the purpose of honouring the memory of Alfred Stevens, and that it is proposed to do this by obtaining further examples of his work for public galleries, and particularly the Tate Gallery, in which it is also intended to place a bronze bust of the artist, which Professor Lanteri has generously offered to model as his gift.

The Bridge House Estates Committee of the City of London and the London County Council are not quite in agreement with respect to the proposed "St. Paul's Bridge," and in answer to the Committee's inquiry whether the County Council were prepared to contribute towards the acquisition of the land required for the northern approach to the new bridge, and, if so, to what extent, and further, if it was the Council's intention in the future to complete the north and south connections for trams, the Clerk to the London County Council replied:—"I have to inform you that the Improvements Committee of the Council are prepared to recommend the Council to make a contribution towards the cost of such a complete scheme as shall be satisfactory to the Council, the Council's contribution being limited to one-half of the net cost of the

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proposed widening of St. Paul's Churchyard between Cannon Street and Cheapside, the contribution being subject to the condition that if the net cost of this portion of the complete scheme exceeds 600,000*l.*, the Council's contribution will be limited to 300,000*l.* The Council's Finance Committee have resolved to support the proposal. This offer is subject to the conditions that the Council shall be satisfied as to the details of the scheme in all respects, and in particular as to the adequacy of the southern approach to the bridge, and shall be satisfied that no further expenditure on its part will be necessary for a considerable period, either with regard to the continuation to the south of Southwark Street of the southern approach or in any other portion of the scheme. It is further proposed that the payment by the Council of the suggested contribution shall be spread over as long a term as possible. The committees concerned will be glad to learn what proposals the City Corporation propose to make on this point. The whole arrangement indicated above is further subject to the Council being afforded such facilities as it may desire for constructing tramways on the new bridge and approaches, it being understood that the Council shall be under no obligation to construct such trams, or, if constructed, to extend them to the north of Cheapside, so as to link up with the existing tramways in Aldersgate Street." The Committee seem inclined to proceed without the County Council.

ROYAL INSTITUTE OF BRITISH ARCHITECTS' TOWN PLANNING CONFERENCE.

LONDON, OCTOBER 10-15.

Preliminary Announcement.

HIS MAJESTY THE KING has graciously extended his patronage to the conference. The Right Hon. John Burns, M.P., will be hon. president, while the president will be Mr. Leonard Stokes, P.R.I.B.A., and the secretary-general, Mr. John W. Simpson, F.R.I.B.A.

The conference will be open to architects and to all others, including ladies, who are interested in the subject of town planning. The membership fee will be one guinea.

Members will receive without further charge:—A card of identity; a case for the various tickets issued; the conference badge; all the literature issued in connection with the conference; a handbook descriptive of the visits and excursions; the illustrated volume of "Transactions," containing the text of the papers contributed, report of discussions, and a record of the conference.

Also invitations to the inaugural meeting at the Guildhall; the reception at the Mansion House by the Lord Mayor; the conversazione given by the Royal Institute of British Architects.

And will be entitled to attend all the meetings of the conference; the exhibition of drawings and models at Burlington House; the special exhibition of town-planning literature and documents in the library of the R.I.B.A.; the exhibition of plans of London in the Guildhall; the visits and banquet (on payment of the necessary charges).

By the kindness of some members of the Zoological Society of London a certain number of tickets of admission to the Gardens of the Society's Collections in Regent's Park for Sundays, October 9 and 16, will be placed at the disposal of foreign members, and allotted in order of application.

The Royal Botanic Society have kindly accorded free admission to their gardens for members during the conference week.

Negotiations are in progress with the British railway companies for the issue of return tickets to London at reduced rates to members of the conference. With regard to these and to reductions on Continental railway systems, members will be acquainted as soon as possible with the arrangements that have been made. Messrs. Thomas Cook & Son have kindly undertaken to give special instructions to their agents at all their foreign offices with regard to information to visitors proposing to attend the congress.

A ladies' committee has been appointed to arrange for the comfort and entertainment of lady members.

By the kindness of the club committee lady members of the conference who are visiting London will be constituted honorary members of the Lyceum Club (for ladies).

The directors of the Arts Club, 40 Dover Street, Piccadilly, have kindly promised to accord to foreign members during the conference the privilege of honorary membership.

Lady members of the conference who are desirous of availing themselves of the privilege of honorary membership of the Lyceum Club, and foreign members who are desirous of availing themselves of similar privileges of the Arts Club, are requested to send their names to the secretary-general as soon as possible.

Original papers, many illustrated by lantern views, will be read on:—

"Cities of the Past": "The Hellenistic Period," by Professor Percy Gardner, LL.D.; "Rome," by Dr. Thomas Ashby, of the British School at Rome; "The Roman Empire," by Professor F. J. Haverfield, M.A., F.S.A.; and others.

"Cities of the Present," by Professor Baldwin Brown, Hon. Associate R.I.B.A., Mr. C. Mulford Robinson, of Rochester, N.Y., Mr. H. V. Lanchester, F.R.I.B.A., and others.

"City Development and Extension," by Mr. Raymond Unwin; Monsieur Augustin Rey, A.D.G., of Paris; Mr. W. E. Riley, F.R.I.B.A., superintending architect of the London County Council; and Professor Dr. Rudolf Eberstadt, of Berlin.

"Cities of the Future," by Professor C. H. Reilly, M.A.Cantab., of Liverpool University; Monsieur Eugène Hénard, A.D.G., author of "Les Transformations de Paris"; Mr. Daniel H. Burnham, of Chicago, U.S.A.; and Mr. L. Cope Cornford.

Special papers have also been promised by Col. Eustace Balfour, A.D.C., F.S.A., "The Town Planning Act and Open Spaces"; Sir W. B. Richmond, K.C.B., R.A.; Professor Geddes, of Edinburgh, "The Civic Survey"; Mr. H. H. Statham, F.R.I.B.A., "A Suggestion for the Treatment of Trafalgar Square"; Mr. John Sulman, F.R.I.B.A., "The Federal Capital of Australia"; Mr. T. H. Mawson, Hon. Assoc. R.I.B.A., "Public Parks and Gardens"; Mr. Basil Holmes, C.C., secretary of the Metropolitan Public Gardens Association, "Open Spaces, Gardens and Recreation Grounds"; Mr. W. H. McLean, city engineer of Khartoum, "The Planning of Khartoum and Omdurman"; Mr. Arthur Crow, F.R.I.B.A., "Town Planning in Relation to Old and Congested Areas, with Special Reference to the Inner Belt of London"; Mr. C. H. B. Quennell, F.R.I.B.A., "Town Planning and Land Tenure"; Mr. Harold C. Dowdall, M.A., B.C.L., of the University of Liverpool, "The Growth of Legal Control over Town Development in England"; Professor S. D. Adshead, F.R.I.B.A., and others.

The executive committee will be glad to receive papers on any of the above subjects for presentation to the conference. Papers may be written in English, French, German, or Italian.

Papers must reach the executive committee before September 12, 1910.

The language of the conference for the purpose of discussion will be English.

The papers contributed will be read and printed in whichever of the above-mentioned four languages they are written, and will so appear in the volume of "Transactions." Members of the conference specially interested in any of the subjects to be dealt with at the meetings can have advance copies of the papers to be read sent to them on application to the secretary-general.

The notices issued during the conference week will be in French and English.

Several ladies and gentlemen will give their services during the conference as honorary interpreters, and will wear coloured ribbons indicating the nationality of the language with which they are conversant.

By the courtesy of the Royal Academy an exhibition of models and drawings illustrating important town-planning schemes in various countries will be held in the galleries of the Royal Academy, Burlington House, Piccadilly.

With the consent of the Corporation of London, the City surveyor, Mr. Sydney Perks, F.S.A., F.R.I.B.A., has undertaken to arrange a selection of maps and plans of London, from the City collections in the Guildhall.

The rooms of the library of the Royal Institute of British Architects will be devoted to an exhibition, arranged by the librarian, Mr. Rudolf Dircks, of literature dealing with the subject, as well as of maps and original drawings possessing either a direct or cognate interest, selected from the Institute collections.

The inaugural meeting will be held at the Guildhall (by kind permission of the Court of Common Council), on October 10, when the inaugural address will be delivered by the Right Hon. John Burns, M.P.

The conference dinner will take place at the Hotel Cecil on Wednesday, October 12, in the Grand Hall, at which it

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is expected that a large number of members of the conference, including ladies, will attend.

The following visits have been provisionally arranged, of which further particulars will be issued:—

On Tuesday, October 11, to Letchworth Garden City, Hampton Court Palace, and Hatfield House. The Art Workers' Guild have kindly undertaken to arrange a visit to the Inns of Court, and to offer tea in their hall of Clifford's Inn to the visitors.

On Wednesday, October 12, to Bedford Park, the London County Council housing schemes, St. Paul's, St. Bartholomew's, the Tower, and Greenwich Hospital.

On Thursday, October 13, to Hampstead Garden City, and to Kensington Palace and Gardens.

On Friday, October 14, to Regent's Park and neighbourhood, Bridgwater House, and Stafford House.

On Saturday, October 15, to Port Sunlight, Bournville, Bath, and Oxford.

ACOUSTICS OF PUBLIC HALLS.

THE Usher Hall competition affords a good opportunity for further study of the science of acoustics. The conditions of the competition, as mentioned in our last issue, made this an essential point, and competitors have responded in a very interesting manner.

Six different kinds of plan have been submitted, viz. the oblong rectangle, the semicircle, the circle, the cross, the trumpet-shaped or ovoid, and the ellipse.

Several competitors have followed the oblong rectangle of the present Synod Hall with its rounded corners, but this, while good for sound, is defective for vision, auditors in the side galleries having to turn sideways towards the platform.

The semicircle gives every auditor an equal chance in sound and sight, failing somewhat where it joins the chord, and most decidedly in providing a surface for echo in the blank wall that defines the chord.

The circle, while conveying sound with facility, loses its advantage if the speaker stands to one side or the other of the centre; the result is an echo which was very noticeable in the circular hall of the last Glasgow Exhibition.

The cross is evidently inadmissible, as four angles project into the area of the volume of sound, preventing its free passage and furnishing corners in the side arms which are not usable; this is found to be the case in the Edinburgh Music Hall.

There remain the ovoid and elliptical forms, and the claim to good acoustical properties seems to rest with one or the other of them. They are favourite methods in the competition. The chosen design has its plan of the ovoid shape, and is so commended by the assessor. It has the advantage of concentrating the waves of sound in their initial movement and at the same time of directing them in their course, but it cannot be said to be so graceful a form as that of the ellipse. Besides the latter gives the alternative of placing the platform or orchestral seats either at the side or at the end, which, of course, the former does not.

It may be objected that a side platform arrangement does not accord with the law laid down by Sir Christopher Wren and later writers on the proportionate direction which sound follows in the front and side of the speaker. But if one of the four plans submitted in the competition in which the authors follow this system be referred to it will be found that it really does so, the sound fitting the shape as a hand fills a glove.

Wren's proportion of front to side is 50 feet and 30 feet; another authority puts it at 92 feet and 75 feet as the distances at which a speaker can be conveniently heard. The plan referred to has the wall opposite the speaker 96 feet distant, and at the side or end of the ellipse 74 feet, a very close approximation to either of these two standards.

This arrangement, moreover, affords every sitter a direct radial view of the speaker in both area and galleries, which the end system does not so perfectly secure in the side seats of the galleries. In these seats there is the objectionable necessity of the auditor having to turn round to see the speaker or the performers.

There is working precedent for the side platform system in the plan of the Edinburgh U. F. Assembly Hall, which is considered to be very effective acoustically, but it has the drawback of being a square-ended cross without any rounded corners.

A remaining point for consideration is, what are the best proportions for a hall following any of these systems? The plan above referred to, according to the report submitted with it, adopts the figures 3, 4 and 5 as the relation of height to width and length, following Sir Isaac Newton's inference from the forty-seventh proposition of the First Book of Euclid. The proportions of the accepted design are 2, 3 and 4, but no reasons are assigned in the description accompanying it for the selection of these figures.

It is worthy of consideration whether it would not be well to find out what are the relative proportions of the transmission of sound in the Albert Hall at Hyde Park, both from the end and from the side of the ellipse, accompanying the result with a statement of the three dimensions of length, width and height.

ROYAL ARCHÆOLOGICAL INSTITUTE.

By OUR SPECIAL REPRESENTATIVE.

(Continued from last week.)

Friday, July 22.

Christ Church.

THE programme commenced with a visit to the college of Christ Church. Tom Tower, under which entrance was obtained, together with a considerable amount of the remainder of the façade facing St. Aldate's, was obscured by scaffolding. In 1525 Wolsey suppressed the house of the Austin canons which had stood on the site for 500 years, for the purpose of founding his Cardinal College. The south range of the Tom Quad, including the hall and kitchen, together with the greater part of the east and west ranges was completed before Wolsey fell into disgrace, and the college was confiscated by Henry VIII., who reconstituted it in 1546. At a meeting held on Thursday evening Professor F. J. Haverfield had read a short paper on the extent of Wolsey's work, with particular reference to the front on St. Aldate's. Professor Haverfield strongly advocated the opinion that the existing symmetry of the quadrangle and of the west elevation with its two massive bastions at each end and Tom Tower in the centre was not intended by the founder. The St. Aldate's façade, as left by Wolsey, did not, he argued, extend as far north as the north bastion, but stopped abruptly about halfway between it and Tom Tower. There is a cross wall about 3 feet thick at this point, and in it four windows have been discovered looking north. Moreover, fragments of the shrine of St. Frideswide from the adjacent Christ Church Cathedral were found some twenty years ago built into an inner wall of the north bastion. The shrine of St. Frideswide, however, was not destroyed till 1538, some years after Wolsey's death. Still stronger evidence lay in the documents recording that this bastion was not erected till the completion of the north side of the Great Quadrangle between 1660 and 1668. It was fairly certain, said Professor Haverfield, that Wolsey intended the north side should be given up to his chapel, and such a building would ill-accord with the bastion. Moreover, a stout cross-wall exists at a corresponding point in the other range of buildings forming the east side. There seems reason to believe that Wolsey never meant the present symmetry to exist. It is likewise debated whether the south bastion was not intended to carry a tower. Round the quadrangle runs the pavement of what would have been the cloister, the springers of the vaulting being against the wall. The massive foundations of the buttresses are, however, an addition of a few years ago. The Tom gate was left unfinished by Wolsey. In 1682 Wren crowned it with the present dominating tower with its fan vaulting and cupolas. The hall is reached under a rather low square tower in the south-east corner of the quadrangle. The tower seen from the outside only dates back thirty years, but the remarkable fan vaulting of the entrance hall and its broad stone staircase was erected in 1640. The hall is the largest in Oxford and is practically as Wolsey erected it. It contains several notable portraits. The college library dating from the eighteenth century is detached from the Tom Quad and forms one side of the Peckwater quadrangle which lies to the north-east.

Oxford Cathedral.

The cathedral church of St. Frideswide was entered through a passage in the east side of the Tom Quad leading immediately into the nave. Three of the western bays were pulled down by Wolsey to make room for his projected chapel on the north side of Tom Quad. The first ecclesiastical buildings on this site formed the nunnery built by King Didan about 730, for his daughter St. Frideswide. In 1887 the late Mr. J. Park Harrison discovered remains in the canons' garden at the east end of the Lady chapel, which he claimed to be the three apses of the original small church. With this opinion Mr. Harold Brakspear, F.S.A., who acted as cicerone, agreed. Particular attention was paid to the shrine of Purbeck

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marble, which was intended for the relics of St. Frideswide. The shrine was broken up in 1538. All the recovered pieces have been put together and the shrine set up in the easternmost arch between the Lady chapel and the north choir aisle. The shrine was explained by Mr. Hope, who also dealt with the other remarkable tombs in this part of the church. In referring to the so-called "watching chamber," Mr. Hope expressed his conviction that it was never intended as a watching place over the adjacent shrine, but that it was set up as a chantry-tomb with an altar in the chamber overhead. About twenty years ago he and some others had opened the vault immediately under the tomb, containing an oak coffin, in which were the remains of a woman.

Stanton Harcourt.

In the afternoon the party motored to Stanton Harcourt, stopping for luncheon at Eynsham. In the open space to the north of the latter village stands the base and shaft of a fine market cross. The first thing seen on reaching Stanton Harcourt were the old village stocks on the roadside. Professor W. Boyd Dawkins, by way of preface, explained the origin of the word Stanton, i.e., stone town. A mile to the south of the village are three great standing stones 200 yards from each other, which represent part either of a great circle of stones, or of an avenue of them. Hence came the name of the Town of the Stones. The church, which was described by Mr. E. H. New, falls into three periods, (1) the Norman nave, (2) the Early English chancel and transepts, and (3) the Tudor Harcourt chapel on the south side of the chancel. The fourteenth century is represented by the wooden roof, a very beautiful shrine in the chancel, and the fragments of a tomb opposite it. Across the chancel arch is a well-known Early English screen, and this was described by Mr. Aymer Vallance. The most conspicuous feature about it, apart from the early date, is the number of small openings carved at different levels in the lower part without regard to any particular order. Mr. Vallance thought the supposition that they were cut for the purpose of Confession might be dismissed; he preferred to think they were to allow small children who crowded round as close as they could to witness the Elevation of the Host at Mass. The screen was painted and retains the traces of a female figure. Another very notable feature is the canopied shrine or Easter sepulchre of elaborate Decorated design on the north side of the chancel. This was commented on by Mr. St. John Hope, who suggested that the alternate male and female heads on the top might have been carved by the same hand, or at any rate came from the same shop, as the shrine of St. Frideswide at Oxford Cathedral. The whole structure is of Purbeck marble, highly wrought and beautifully polished. It consists of open arches of ogee form elaborately crocketed, and with finials in between. It is decorated with shields of arms, four on the south side, four on the side against the window (and which now cannot be seen owing to its closeness to the wall), and a single pair at each end. Some of the shields have their armorial bearings sculptured, while others are painted. Unfortunately the paintings have been defaced. Over each shield there is sculptured in the cornice a head alternately male and female. Each pair of shields represents a man and his wife. Mr. Hope said in general construction it was very much like the base of a shrine, though no shrine is known of such a character. Nothing appears to be known about it, and it is quite a puzzle. Mr. Hope also suggested it may possibly have been used as an Easter sepulchre, and as there was nothing superstitious about the work it was allowed at the Reformation to remain undamaged. He thought it might have stood on a very low base, especially as in the adjoining Harcourt chapel there are two pieces of marble which might have served for the purpose. The Harcourt chapel contains several family monuments of which the most interesting is that of Sir Robert Harcourt and Margaret his wife, 1471, both of whom wear the Order of the Garter. There are only two other effigies of ladies showing this decoration; one is at Ewelme, not very far away, where it is worn by Alice, Duchess of Suffolk, who died in 1475.

Not many yards from the church is the manor house, which was the seat of the Harcourt family from the twelfth century until 1711, when Simon Harcourt, Lord Chancellor and the first Baron, transferred the family seat to Nuneham Courtney, six miles due south of Oxford. The manor of Stanton was given in 1130 by Adeliza of Louvain (one of the queens to Henry I.) as dot to her cousin Millicent, on her marriage with Sir Richard de Camville. On the departure of the Harcourts the manor house quickly fell into a ruinous condition as is attested by the letters of Pope, who did some literary work here in 1718. The principal remains now are the splendid fifteenth-century kitchen and the tower, known as Pope's Tower. These were connected in the poet's time by a suite of apartments, including the Great and Little Parlours and the Queen's Chamber. Pope's Tower probably dates from 1450. The ground floor served as the chapel and ante-chapel, the three storeys above being called successively the priest's room, the priest's bedroom, and Pope's study. The kitchen is another square tower which rises in a single storey to the conical tiled roof to which access is gained by a newel staircase. It is often compared with Glastonbury kitchen. Mr. E. H. New gave the following points of difference:—Glastonbury is 40 feet square, this is 33 feet by 31 feet; the total height of Glastonbury is 74 feet, while Stanton Harcourt is 72 feet. The gate-house, c. 1530, was until lately used as the vicarage; some years ago it was considerably added to, a rather large house being erected on the inner side. The arms of Sir Simon Harcourt can be seen over the entrance.

In the same village is an extremely perfect moated house of which little definite is known. Mr. E. C. New said the property, including the tithes of the rectory, was granted to All Souls College by Cardinal Pole in the reign of Queen Mary. It had originally belonged to Reading Abbey. In Elizabeth's time it was claimed by the Crown, and it was only after long law suits ending in 1590 that it was secured for All Souls. Parts of the house are undoubtedly very old. It was at first entirely surrounded by the moat though now it is enclosed on only three sides. The main block dates from about William and Mary; the only remains of the older building are the low wing running back to the moat and a fire-place. The house bears a striking resemblance, according to Mr. New, to an existing design by Sir Christopher Wren, and was probably strongly influenced by it. The absence of sash windows puts the date about the middle of the seventeenth century, as sash windows came into fashion between 1680 and 1690. At Stanton Harcourt the seven window openings in the front are spaced evenly, whereas in Wren's design they were grouped. At the back the ridges of the roof end in stone gables in a curious and interesting way. In the earlier leases the house was called the Rectory, in 1681 it was called the Parsonage House, and now it is known as the Parsonage Barn. In 1610 in one of the leases with All Souls there is a clause by which the tenant was bound to provide four chambers for the use of the members of the college in time of plague—being sometimes referred to in consequence as the Pest House. In 1727 it was leased to a Dr. William Gibbons, and then to John Arnett, in whose family it has remained ever since. The house contains much of its original panelling, ornamented with paintings of the eighteenth century, some remarkable hangings of stamped Spanish leather, and other fittings, including a series of pictures round the wall of the entrance hall.

Mr. Percy Manning, M.A., mentioned the fact that a house on the site was granted by Richard I. to an adherent. In 1327 a licence was granted to crenellate it; the moat probably dates from that year. Two years later a John Wyatt received a licence to make a park.

Saturday, July 23.

Corpus Christi College.

The moral which Mr. Case, President of Corpus Christi, drew from the structural history of his college was that beauty in building after being arrived at with such difficulty, is destroyed by unthinking successors with the greatest ease. The college was founded by Bishop Fox in 1517, and by 1528 it was a complete collegiate group of striking beauty, as may be judged from Loggan's view. It comprised the present front quadrangle, having on the north the gate tower, on the south the library and chapel, on the east the hall and kitchen. That compact and well-proportioned completeness was soon lost in the desire to provide extensions.

The next college to be visited was Magdalen. After this the party motored to Youlbury, Boar's Hill, where Mr. A. J. Evans entertained the party to luncheon and a garden party afterwards. In the various rooms of the house a selection from his collection of antiquities was displayed.

Monday, July 25.

Oxford Castle.

The first visit on the programme for Monday was to Oxford Castle. Here Mr. St. John Hope gave a brief explanatory sketch concerning early English mediæval castles. Before the Norman Conquest, he said, such things as castles did not exist. Only two castles are mentioned in Anglo-Saxon chronicles, and both of these were erected by Norman favourites of Edward the Confessor. One of the chief means by which William the Conqueror effected the subjection of this country was by the establishment of castles at various strategical points, such as

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Oxford. It was, insisted Mr. Hope, a matter of simple history that the first and only power that could have put them up about that time was the conquering Norman; whereas in Saxon days there was no great ruling power capable of doing so. In order to come to any other conclusion it is necessary to overlook the fact that they were erected in important positions with the sole intention of bringing about the conquest of the country. Every important town situated on a waterway was provided with a castle, which controlled it; this was due to the fact that the first important people with which the Conqueror had to deal were the Danes, and they largely used the rivers for locomotion. It must also be remembered that the country was not then drained as now, and there used to be waterways where there is now scarcely a brook. At the same time the castle overawed the turbulent natives who were disposed to resist the invaders. They were to be found at places like Durham, Norwich, Shrewsbury, Lewes, and Arundel. At Oxford the castle is planted at the end of the town which impinges on the river.

The Norman castles are almost all of one type, one of the chief features being a great mound of earth obtained by digging a deep ditch and throwing the material up in the centre. Appended to this were baileys or large courtyards defended by moats or ditches. Sometimes it happened, as at Oxford, that the river enabled them to partly dispense with the earthworks as a means of defence.

According to Mr. Hope, local historians fail to bear in mind that Oxford Castle was no earlier than the Norman reign. One of the things which bothered them was the account of the city in Domesday book. This shows it to have had 721 houses inside and outside the walls, of which 478 were untaxable, being unoccupied and ruined, and 243 paid geld or tax. The number of ruined houses has always been a puzzle, and to account for them a view became widely adopted that they were destroyed in the course of a long siege in 1068 by the Conqueror, referred to in contemporary chronicles. This siege is really a myth as far as Oxford was concerned, said Mr. Hope, for the chronicles refer to "Exonia," or Exeter, and not to "Oxonia." Mr. Hope thought there was a possibility that the houses were destroyed before the Conquest by bands of marauding Danes returning from a witan. The solution was largely to be found in the formation of the castle itself. It was bounded by the stream, Bulwarks Lane, Castle Street, and Paradise Street, which formed the inner bailey of the castle. The present church of "St. Peter-le-Bailey" does not now stand on the same site as it did when originally known as "St. Peter-in-the-Bailey." It was first built in the outer bailey of the castle, which then extended over a whole quarter of the city as far westward as the Carfax. This in itself would account for the destruction of a large number of dwellings as recorded in Domesday. It is paralleled in the contemporary accounts of other towns like Lincoln, where houses were destroyed *propter castellum*. When the time came for replacing the palisade with stone, they found that the inner bailey would be adequate for police purposes, and they consequently confined their attention to defensive works in the inner bailey. Robert d'Oily, d'Oilgi, d'Oyly, or d'Oiley was the builder in 1071, and by 1074 it was sufficiently complete for him, in conjunction with Roger d'Ivry, his sworn brother, to establish within the walls the collegiate church of St. George. The original great hall is now represented by the Assize Court. At Leicester and Oakham the original hall of the Norman castle is still used for assize work. At Oxford and Cambridge the hall was replaced by a new block of buildings. These castles were always in the custody of the Sheriff, who was the King's officer and responsible to him and not to the Mayor. A wealth of evidence has been found by Mr. Hope in the Pipe Rolls concerning the early building. A very great deal of it is now destroyed. The castle, according to maps, was originally surrounded by a wall with towers at intervals; only one of the latter has survived. The inner works were entered from Castle Street by a bridge over the ditch, which stood about where the Salvation Army barracks now are.

An inspection was then made by the visitors of the St. George's Tower, a high mound of earth, and of the crypt of the Collegiate Church. The date of the latter is about 1071; its capitals are strongly reminiscent of Roman work. This is explained by the fact that they were probably carved by Saxon workmen who only had Roman Corinthian capitals to inspire them. The crypt is 31 feet by 24 feet 6 inches. The mount is pierced by a tunnel which leads to a large circular well-chamber. This mount, like most of the rest of the building, was first defended by fortifications of wood, as the earth would not be firm enough to sustain the weight of a solid stone structure. Several such defences are represented in the Bayeux tapestry. The Pipe Rolls of 1172 show that the sum of 66*l.* odd (calculated by Mr. Hope to be equivalent to 1,500*l.* of our money) was expended on erecting a house and the well on this mount. The well would be the last thing to be completed, and in 1173 there is an entry of 19*l.* odd for finishing the well. Local authorities are divided as to whether the great tower which stood on the mount, half within and half without the line of works, was round or polygonal. Mr. St. John Hope said there was ample evidence to show it was the latter. This part of the castle dates from the reign of Henry II., when very considerable fortresses were erected all over the country owing to its disturbed condition, and to the turbulence of the Barons. All of these had square towers. About this time, said Mr. Hope, there was built quite a long line of important fortresses, including those at Bridgnorth (1168-70), Bowes (1186-88), Chilham (1170-75), Dover (1181-88), Newcastle (1171-77), Peak (1175-76), and Richmond (1172). Oxford was for quite a long time an important fortress. The old maps show in one direction a curious place called "The Jew's Mount." Mr. Hope said there could be no doubt that this was a siege work done in Stephen's reign. Stephen besieged the castle, and the Empress Matilda effected her escape from within by crossing the frozen river in white garments. The next day the castle surrendered to Stephen. The building was demolished by order of the Parliament in 1649, with the exception of one of the minor towers, the crypt and some fragments of walls.

Rycote Chapel.

The unusual position of Rycote Chapel, standing in the midst of fields and about a quarter of a mile from the road, is explained by the fact that although as large as many country churches it was never intended and has never served as one. It was erected in 1449 by Richard Quartermayne as a private chapel to his house, which stood a very short distance away. Richard and Sybil Quartermayne were not, however, buried here, but at Thame Church, about a mile away. In the first half of the sixteenth century the estate fell, with many others in Oxfordshire, into the hands of Lord Williams, who had made himself conspicuous for his zeal as commissioner for the dissolution of the monasteries. In 1539 he built a magnificent mansion with a large lake, using the older house of the Quartermaynes as stables and offices. Here he entertained Princess Elizabeth first as a prisoner in 1554, and then as a Queen in 1566 and 1592. Later James I., Charles I. and II., and Anne visited the fine mansion, which served very frequently as the first stopping-place for distinguished travellers returning from Oxford to London. About 1750 the north wing was destroyed by fire, and by the end of the century the house was pulled down by Lord Abingdon, who made Wytham his seat. Little remains now except a detached block with stables, which probably served as a house for the chief bailiff, a brick tower, and the chapel.

It is the chapel which is the attraction to visitors. It is quite complete, with a nave and chancel under one roof and a western tower. This Perpendicular tower contains a priest's room containing a nice fireplace, and a wooden partition runs across the belfry chamber above, which may have served as a bedroom. The staircase wall is pierced at one point so as to allow of a view of the nave. In the first half of the seventeenth century the Gothic interior was greatly altered by the introduction of the greater part of the present remarkable fittings. The most arresting thing about this chapel is the deplorable ruin into which it has fallen. The vicar of the parish, who received the party, explained that although it had always been his desire to do something, he was powerless. There are so few people round about that, as a church, it would prove a "white elephant." The only hope would seem to lie in Lord Abingdon being stirred by family pride to spend 1,000*l.*, or even 500*l.*, in arresting further decay and rearranging the interior with the fittings which lie about, and converting it once more into a noteworthy and handsome family chapel. The second most conspicuous features are the two elaborate Renaissance pews adorned with painting and carving, which have taken the place of the rood-screen. These now share in the general ruin. They served no doubt to accommodate the lord of the manor and any distinguished guests. The one on the north side is of two storeys, the upper of which is reached by a narrow staircase built in the wall. It is suggested that this upper storey may have served as an organ loft. Mr. St. John Hope said there was a similar pew at Kidderminster which had been put up in 1630. Owing to the greater delicacy of the decorations he placed the Rycote pew later. The chancel retains its fifteenth-century stalls, but the reredos is Renaissance. The presence of a font in a private chapel is unusual, but Mr. Hope explained that the building was licensed not long after its completion to have all the privileges of a parish church. Some of the windows retain

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their original tracery, and the black and white marble flooring to the chancel also remains. There is a two-decker Jacobean pulpit with a sounding-board.

Thame.

Thame is a rather straggling market town twelve miles east of Oxford. The three places visited in it were the prebendal house, the church, and the grammar school. The town at the Conquest was in the jurisdiction of the Bishop of Dorchester, and when the bishopric was transferred to Lincoln in 1085 Thame became the property of that diocese, and the present church was erected by the great Bishop Grossetête and attached as a prebend to the cathedral. At the same time he erected the prebendal house and chapel to the north-west of the church. It is thus described in the programme of the Royal Archæological Institute:—"The prebendal house is an interesting example of a thirteenth-century house, now partly ruined, with additions of the fourteenth and fifteenth centuries. The earliest portion had the chief rooms on the first floor, and still retains complete the chapel and the solar with its fourteenth-century lengthening and roof. The fifteenth-century hall on the ground floor, with its porch, solar, &c., form the present dwelling-house, which is now detached from the rest of the building through the loss of the intermediate thirteenth-century great chamber, &c. The building and its offices were disposed about a quadrangular courtyard, and were apparently once surrounded by a moat." Mr. St. John Hope prefaced his description of this purely domestic structure by giving a brief review of the development of the English house. The kernel of the mediæval house was, he said, the hall, and at the beginning it consisted of nothing else. In it was a large open fireplace in the centre, with pallets ranged round on which the people slept. In Saxon times privacy was not considered necessary; men and women both slept in the big hall, the only distinction between the sexes being that one side was screened off for the use of the women. As things became more civilised the lord of the place created at the end of the hall a separate room for himself, this bower or boudoir being used during the day by the ladies. Later there was a tendency to raise the living-rooms on to a floor over the boudoir, where they enjoyed more comfort and privacy. Next a separate kitchen was erected at the passage end of the great hall, and a service block in connection with it. When circumstances demanded it they did not keep to alignment, but arranged their buildings in the way most convenient. At Thame they commenced with the hall; then came the great chamber (now destroyed) with its undercroft, and at right angles to it the chapel with another undercroft, and the dormitory on the other side of the chamber. A western range of buildings, which are likewise now destroyed, formed a parallel side to the hall and chamber with the kitchen block. The great chamber was lengthened in the fourteenth century, a new roof being erected at the same time. Apparently not very long after it was finished they found the house was too small, and the hall was rebuilt. But the living rooms were not now upstairs, but on the ground floor, in accordance with fashion. That hall forms the present house, but it preserves nothing of its original arrangement. The small Early English chapel stands some feet above the ground. It contains a beautiful lancet triplet recessed at the east end. It has been said that this chapel might be taken for a part of Lincoln Minster. The dormitory has an open timber roof.

Thame Church.

The prebendal church of Thame, as already mentioned, was rebuilt by Bishop Grossetête in 1240 on a larger scale than the existing Norman structure. As this church and that at Aylesbury differ from their neighbours in plan and details, it is often said that they were the work of masons brought from Lincoln by the Bishop. The aisles, however, were reconstructed a century later; the nave clerestory was added about 1390; its windows are fourteenth-century work. The tower, with its fourteenth-century lantern, was strengthened about this time by two enormous piers. The transepts were remodelled shortly after. The churchwardens' accounts commence in 1442, and one of the earliest entries are the bills and subscription list in connection with the making of the solars or upper chambers over them. These solars were used for the storage of valuables; they have both been removed. Mr. St. John Hope pointed out the parclose screen in front of the organ in the north transept, remarking that it was a stone screen carried out in wood, for the fourteenth-century workers had failed to realise the greater freedom and delicacy which was possible in wood. He suggested that it may have stood across the nave until the reign of Henry VIII. In the south transept there is a curious effigy placed upright in the wall which may have covered the grave of one of the first priests at Thame. In the same transept are two Quartermayne tombs, one with the effigies of Richard and Sybil Quartermayne (1460), the founders of Rycote Chapel. In the other transept is an altar tomb with brasses to Geoffrey Dormer, his two wives and twenty-five children. By far the most splendid of the tombs is that in the centre of the chancel. It commemorates Lord Williams (1559), who at the dissolution of the monasteries secured Thame, Rycote, and other rich manors. The figures of himself and his wife are in alabaster and the altar tomb is splendidly panelled. Both figures are with their feet pointing to the west, and Lord Williams is in his peer's robes, which is also unusual. It is surrounded by an iron grille or, rather, to use an English word beloved of Mr. Hope instead of a French one, by an iron grate. The brass chandelier is also noteworthy. Mr. Hope pointed out that the recessed tomb in the south wall of the chancel is an instance of the use of white metal to represent silver in armorial bearings; here the zinc is still perfect.

Mr. Aymer Vallance briefly dealt with the two screens. That across the north transept he attributed to the fourteenth century, though not constructed like most of them, being more like a fifteenth-century screen in the arrangement of its upper part. It bears a curious survival of the dog-tooth moulding in the arch over the entrance. The chancel screen savours of the Renaissance and suggests foreign influence. The treatment and general detail reminded Mr. Vallance very strongly of a screen and rood-loft dated about 1500 at Charlton-on-Otmoor, which is three or four miles distant, though the latter is vaulted, while that at Thame is rectangular. He dismissed the suggestion that it might have been brought from Thame Abbey at the Dissolution, as in such a case it would have been a solid screen.

The party had tea in Lord Williams's Grammar School (1575), at which several well-known men have been educated, including John Hampden, Anthony Wood, Dean Fell of Christ Church, and Edward Pococke, the Orientalist. The school is not at present in use. The almshouses at the entrance were erected by the Quartermayne family, and were re-endowed by Lord Williams.

(To be concluded.)

ILLUSTRATIONS.

DESIGN FOR ORGAN LOFT AND SCREEN IN THE CHURCH OF ST. MARY THE VIRGIN, OXFORD.

ACCORDING to tradition the original church on this site was built by King Alfred for the use of scholars at the University. In the Domesday Book it is mentioned as royal property. The oldest part of the present building is the tower and spire, which dates about 1300. This work, together with the erection of a Lady chapel, was done under the superintendence of Adam de Brome, the founder of Oriel College. The chancel was commenced in 1462, and the nave in 1492. The remarkable south porch was added in 1637 at the expense of Dr. Morgan Owen, the chaplain to Archbishop Laud. The restoration of the church was carried out under Mr. T. G. Jackson, R.A., LL.D., who also designed the organ screen here illustrated.

HOUSE NEAR HOLT, NORFOLK.

THIS house was built some time ago from the designs of Messrs. Clare & Ross.

WOODLANDS, KINGSTON HILL.

THIS house was built some time ago upon a site facing Kingston Hill, and has since been altered for Dr. Roots by the addition of a wing containing consulting room and other offices on ground floor and music room over, necessitating the re-planning and lengthening of the side addition shown on the plan herewith given, and which faces Warboys Road. The external design was influenced by the wishes of the freeholder, who desired that all houses upon the estate should be reminiscent of Georgian work, and the elevations are of red brick and plaster with tiled roofs. Over the entrance doorway a specially-designed plaster tympanum occurs, and internally the decoration was on simple lines, the mantles to principal rooms being designed by the architect and carried out by the builder of the house. The architect was Mr. T. Frank Green, A.R.I.B.A.

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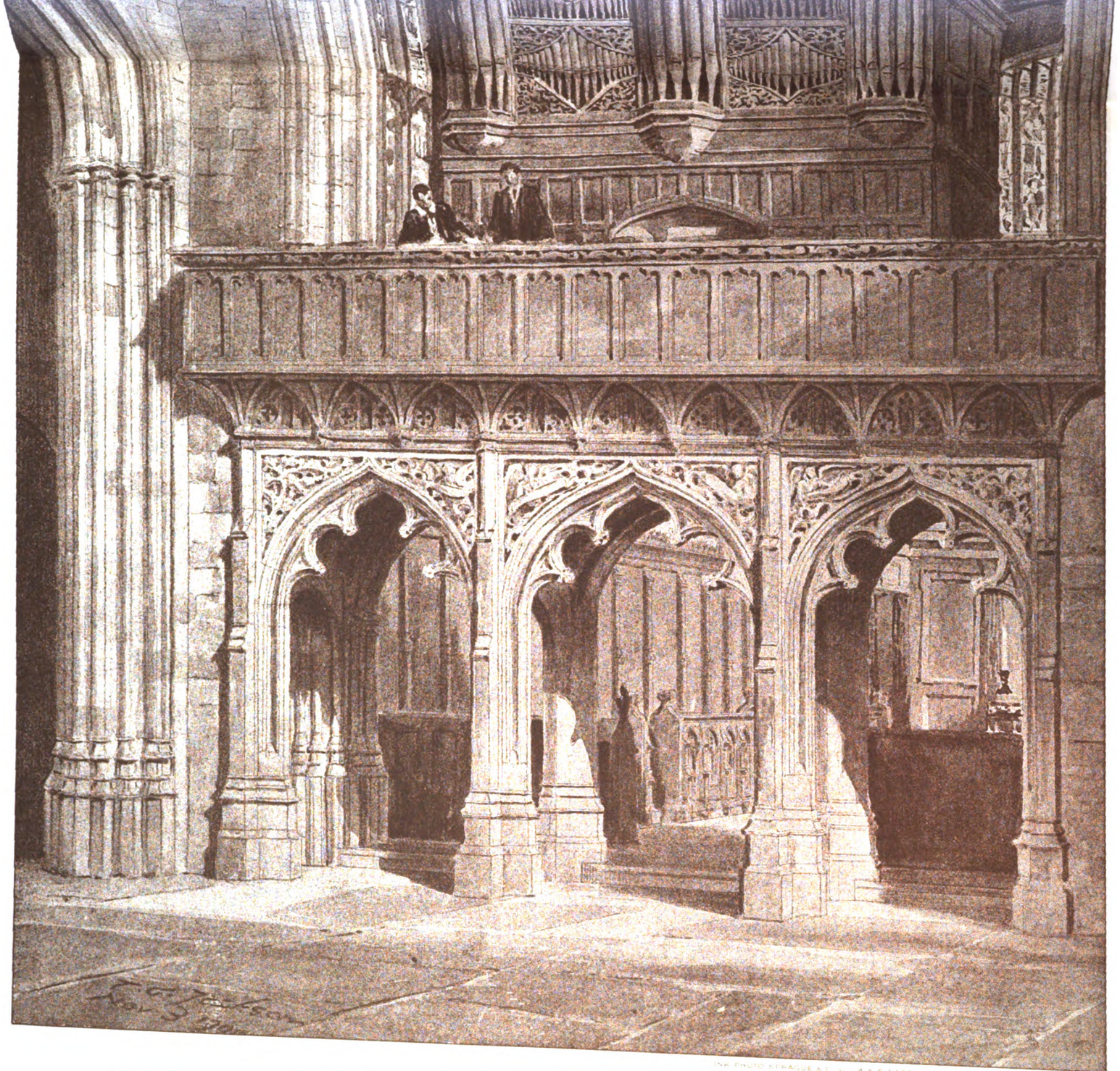
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DESIGN FOR ORGAN LOFT AND SCREEN IN THE CHURCH OF S. MARY THE VIRGIN, OXFORD.

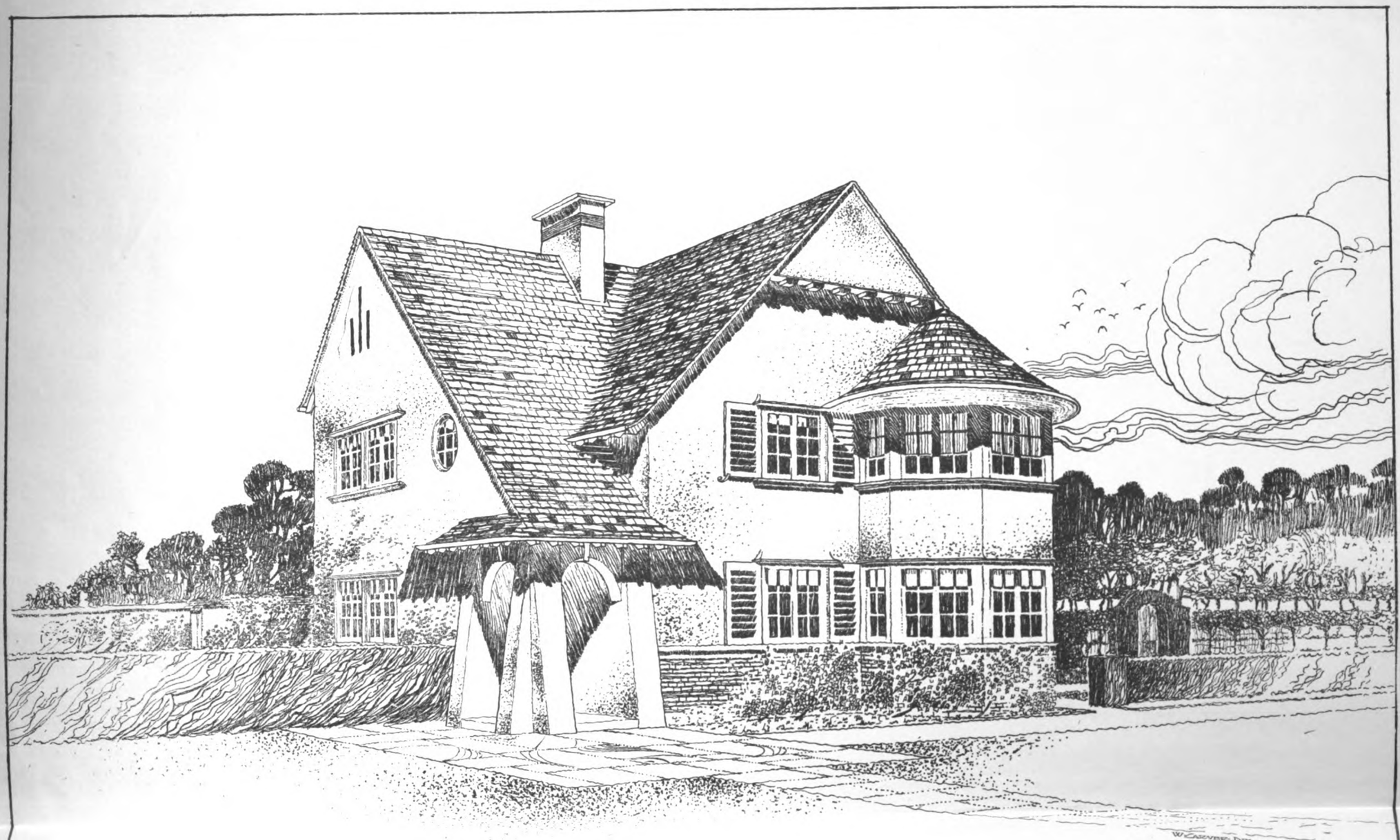
T. G. JACKSON, R.A., Architect.

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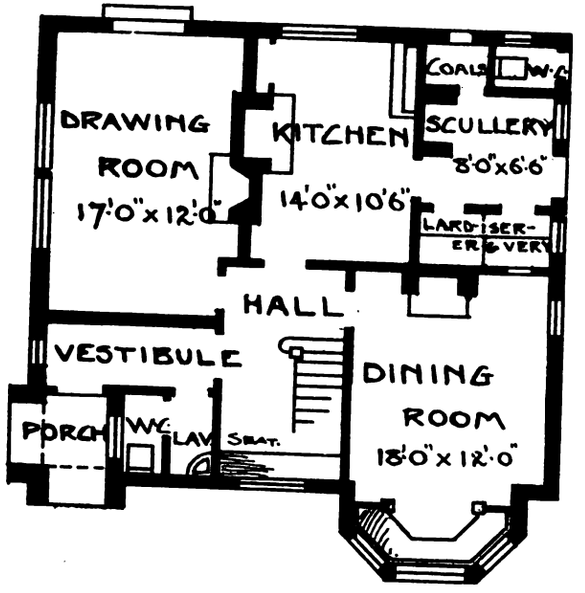
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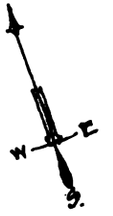
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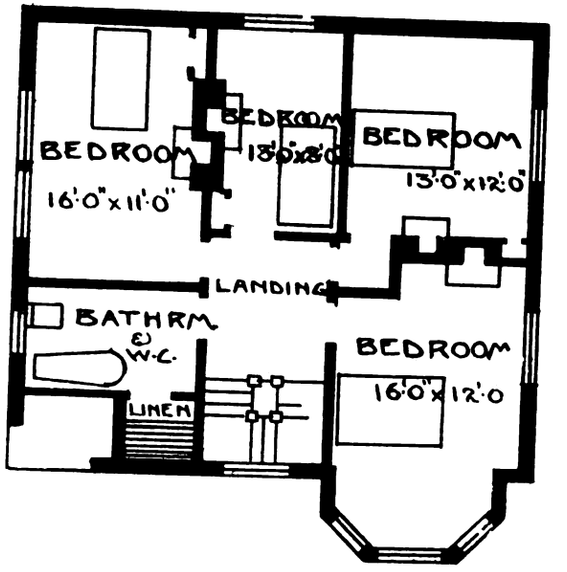


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GROUND PLAN





FIRST FLOOR PLAN

Clare Ross M.S.A.

·ARCHITECTS · 1 WEST ST FINSBURY CIRCUS E.C.

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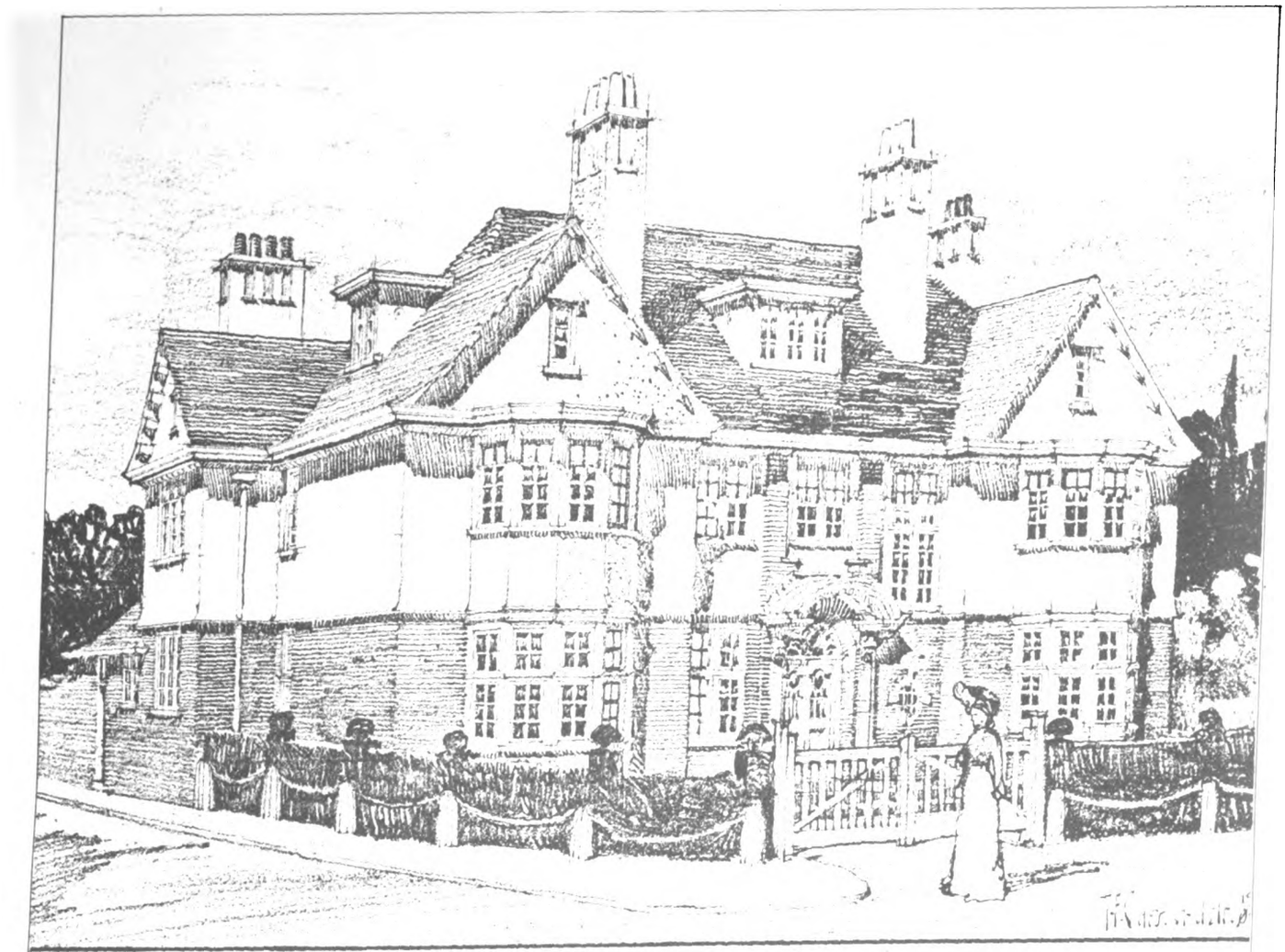
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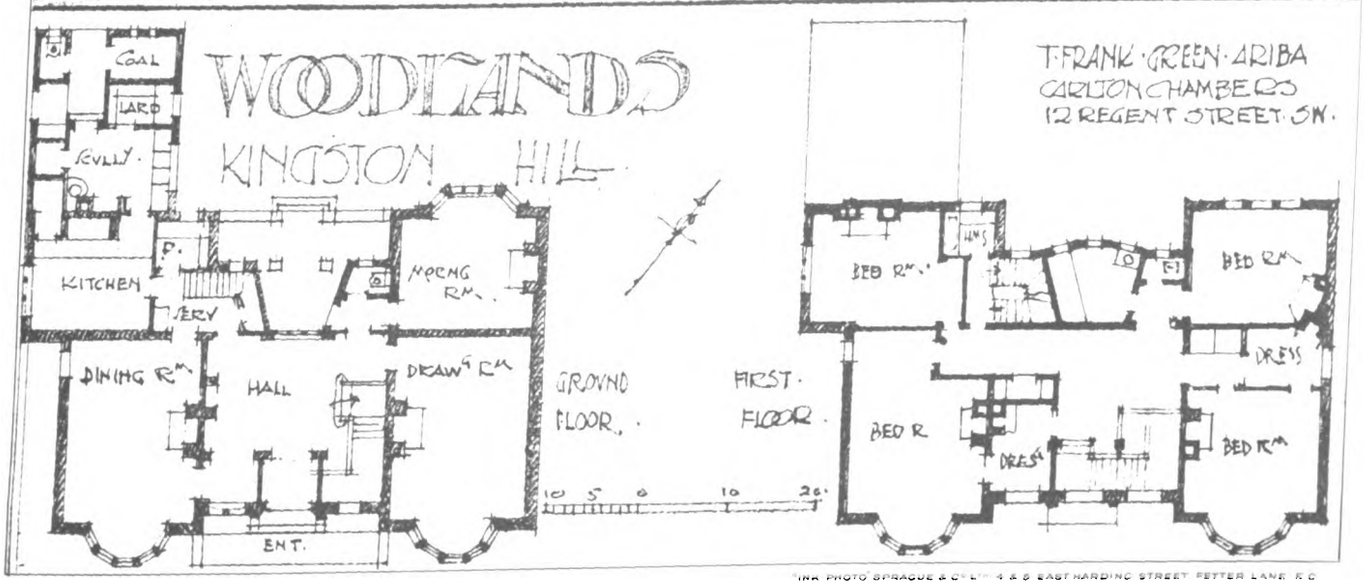
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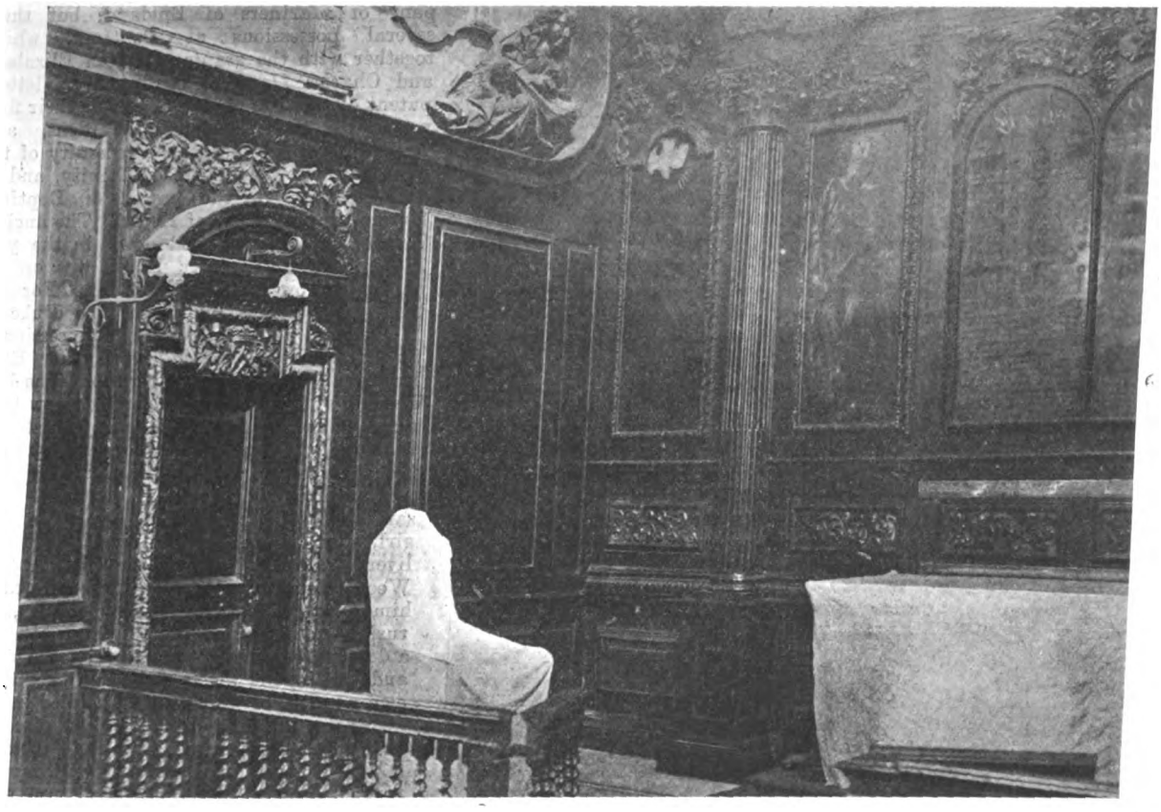
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DEPTFORD AND SAYES COURT.*

PENNANT, the antiquary, says London, Llyndyn, is an ancient British word, pronounced the same as we do now, signifying the town or "fort on the lake." The "man in the street," or as the Americans would say, "the Fleet Streeter," would be very much puzzled to know where the lake stood. A writer in the *London Encyclopædia* in 1827 places the lake at "Mortlake," but it is now known and believed to be nearer home than that place. A town or fort formerly meant much the same thing, and Pennant places the fort at our old friend the Tower of London. This was anciently the landing-place of the Britons for their capital city Verulam; the same as most uncivilised nations do at the present day, viz., place their chief towns in the centre of a forest, at some distance from the shore or landing place, for better security. The lake stretched from Tower Hill to Ludgate Hill on the north, and from Greenwich Hill to Lavender Hill on the south, thus embracing the whole of that space formed by the two bends in the river Thames, on one side the Isle of Dogs, and the other the old borough of Lambeth. Pennant goes on to say:—"This great expanse of water might have filled the space between the rising grounds at Deptford and those at Clapham, and been bounded on the south by the beautiful Surrey hills. Lambeth Marsh and the Bankside evidently were recovered from the water." The embankment of the Thames, whereby this extensive tract of land was redeemed from the river, is now ascribed to the Romans. In the *Gentleman's Magazine* for 1787, Dr. Whitaker writes:—"When the Britons were the sole lords of this island, their rivers, we may be sure, strayed at liberty over the adjacent country, confined by no artificial barriers, and having no other limits to their overflow than what nature itself had provided. This would be particularly the case with the Thames. London itself was only a fortress in the woods then, and the river at its foot then roamed over all the low grounds that skirt its channel. Thus it ran on the south from the west of Wandsworth to Woolwich."

Lysons in his "Environs of London" says:—"Deptford was anciently written Depeford, signifying the deep ford where the bridge now crosses the river Ravensborne." It lies in the hundred of Blackheath, and is about four miles from London Bridge, near the high road (Watling Street) from London to Canterbury and Dover. By an Act of Parliament passed in 1730, this parish was divided into two parishes, St. Nicholas and St. Paul. St. Nicholas includes the old town bounded by the river Thames, and the new parish of St. Paul. It is of small extent. According to Holinshed, "Sir Thomas Wyatt lay a night and a day with his army at this place." The Gun Tavern (now pulled down) is said to have been the residence of Lord Howard of Effingham, the victor of the Spanish Armada. He became Earl of Nottingham; his arms with the Order of the Garter were carved in wood over the chimney-piece of the large dining-room in this tavern.

An excellent portrait of Sir Thomas Smith is given in Lysons: he was farmer of the customs to Queen Elizabeth, and was sent by James I. as his ambassador to Russia in 1604. He had a magnificent house at Deptford, which was burnt down, January 30, 1618. Cowley,* the poet, was for some time resident here. The old church of St. Nicholas consists of chancel, nave, and two aisles. In 1630 it was repaired and enlarged, to which work the East India Company and Sir William Russell were the principal benefactors. In 1697 the whole church was pulled down except the tower (an ancient structure of flint and stone which is still standing), and rebuilt on a larger scale. This church was repaired in 1716 as recorded on a tablet in the south wall on the outside (a view of this church is given in Lysons). It also has a belfry with eight bells, and a gallery, and organ built by Father Smith. There are several memorials to the memory of heroes of the Spanish Armada, and early owners of Sayes Court, and Christopher Marlowe was buried here. The extraordinary and quaint carving in woodwork of the "Valley of Dry Bones" by Grinling Gibbons was formerly in the charnel house, but has been framed and glazed, and placed on the east wall inside the church, by the Vicar, for better security. The subject is taken from Ezekiel xxxvii., and is described in the first ten verses. It is also referred to in John Bunyan's "Pilgrim's Progress" by the name of the "Valley of the Shadow of Death," in these words:—"But when he was come to the entrance of the Valley of the Shadow of Death, I thought I should have lost my man (Fearful); not for that he had an inclination to go back, that he always abhorred; but he was ready to die for fear. 'Oh! the hobgoblins will have me; the hobgoblins will have me!' cried he; and I could not beat it out of him. He made such a noise and such an outcry here, that had they but heard him it was



SANCTUARY OF ST. NICHOLAS CHURCH, DEPTFORD.

* A paper read at a meeting of the Upper Norwood Athenæum by Mr W. F. Potter.

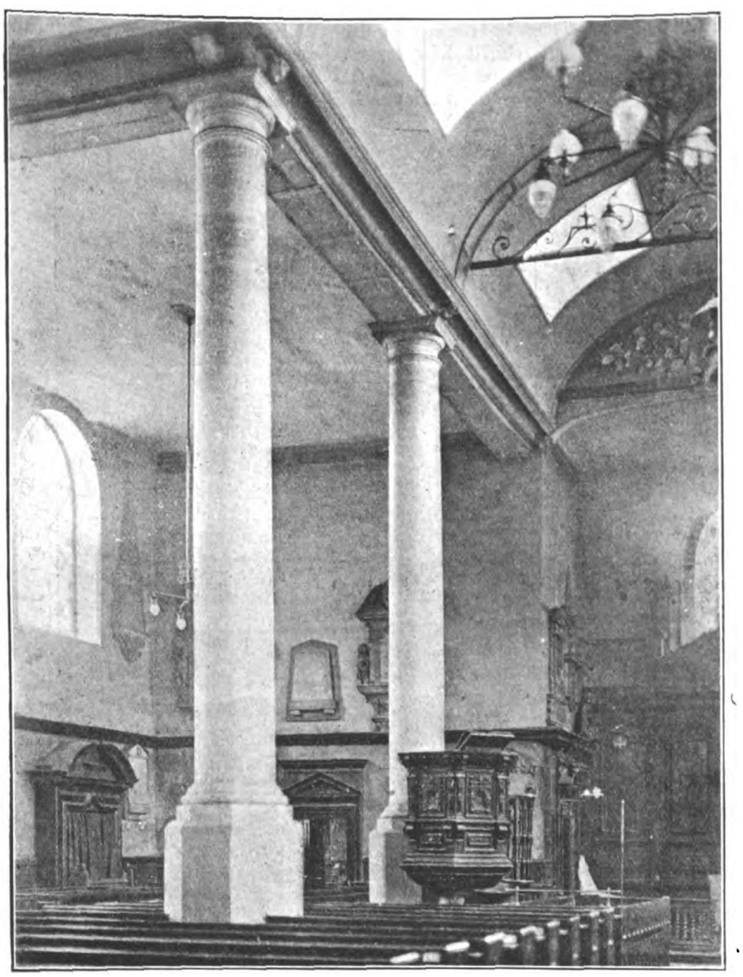
* Cowley died July 27, 1667, at Chertsey. Evelyn, who knew him well, calls him "an incomparable poet and a virtuous man; his very dear friend." He was buried in Westminster Abbey.

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enough to encourage them to come and fall upon us." And again:—

"What danger is the Pilgrim in,
How many are his foes!
How many ways there are to sin
No living mortal knows.
Some in the ditch spoilt are, you can
Lie tumbling in the mire,
Some though they shun the frying-pan.
Do leap into the fire."

The Vicarage, now pulled down, at the foot of Church Street, was a very commodious brick residence with spacious pleasure grounds. The church was again repaired in 1823 and 1842, the cost being partly defrayed by subscription and partly from the parish funds. The tower is of the fourteenth century, the belfry above being a brick addition. As I have already said, Deptford was in 1730 divided into two parishes,



INTERIOR, ST. NICHOLAS CHURCH, DEPTFORD.

St. Nicholas and St. Paul. The latter church was erected in the reign of Queen Anne, under an Act of Parliament for building fifty new churches in and near London. It is in the Roman Doric style of architecture. It contains some very delicate carving in dark Dutch oak, and the chamber pew of the Lords of the Admiralty. Among the rectors was the Rev. Charles Burney, D.D. (brother of Madame D'Arblay), whose library was purchased for the British Museum for 13,500*l*. Among the monuments in the graveyard is one to the memory of Mrs. Mary Hawtree, who died in 1734, and who gave silver christening bowls to St. Paul's and St. Nicholas. On her tombstone in St. Paul's churchyard is this inscription, "She was a devoted mother and the best of wives; she brought into the world more than 3,000 lives." Speaking of very quaint epitaphs, there is one in St. Nicholas's churchyard to the memory of a publican:—"God takes the good, too good on earth to stay; And leaves the bad, too bad to take away." He must have been a much better man than our temperance friends now generally give them credit for, and something like our old friend of the Red Lion, whose son thus immortalised him on his tombstone, somewhere:—

"To the memory of the landlord of the Red Lion;
Who died in hopes of Holy Zion;
Resigned unto the heavenly Will,
His son carries on the business still." (Amen.)

The roof of St. Paul's Church is supported by two rows of columns, and the east window is ornamented with stained glass. The galleries contain an organ, built by Bridge in 1730. When Peter the Great was at Deptford he was waited upon by a party of Friends, including William Penn, and presented by them with books in the High Dutch language, which he understood, and accepted, and afterwards visited their meeting house as a private person, and was very social and accommodating to all. Trinity Chapel was formerly attached to the Trinity House, called the Corporation of the Trinity House of Deptford Strond, which was founded in the reign of Henry VIII. by Sir Thomas Spert, commandant of the great ship *Harry Grace de Dieu*, for the good government of seamen and the better security of merchant ships on our coasts. It was incorporated in the fourth year of Henry VIII., who confirmed to them not only the ancient rights and privileges of the Company of Mariners of England, but their several possessions at Deptford, which together with the grants of Queen Elizabeth and Charles II. were confirmed by letters patent of the first of James II., by their first name of the "Master, Wardens, and Assistants of the Guild or Fraternity of the most glorious and undivided Trinity, and of St. Clement, in the parish of Deptford Strond, in the county of Kent." The ancient Trinity Hall was pulled down in the year 1787, when the Trinity House was erected on Great Tower Hill, in London. For sixteen years before his death, the Duke of Wellington, as master, went in procession to St Nicholas's Church with the Elder Brethren; since then the ceremony has been disused, and the annual celebration now takes place at Trinity Hall, London. Christopher Marlowe, the dramatic author, and who trod the same stage with William Shakespeare, met with a tragic death at Deptford. It is said that falling deeply in love with a low girl, and having for his rival a fellow in livery, Marlowe (as related by Anthony Wood), imagining that his mistress granted him favours, was fired with jealousy, and rushed upon him in order to stab him with a dagger; but the footman avoided the stroke, and seizing his wrist, stabbed him with his own weapon, of which wound he died in 1593.

Early in 1671 John Evelyn discovered that rare genius in art, Grinling Gibbons, in a small house at Deptford, working on a carved copy of Tintoretto's picture of the Crucifixion, which he caused to be shown to Sir Christopher Wren, Samuel Pepys, Baptist May, and other competent judges of art, and afterwards to be taken to Whitehall, where it was seen and much admired by King Charles II., the Duke of York, and the whole court. "The King," says John Evelyn in his Diary, March 1, 1671, "no sooner cast his eyes upon it than he was astonished, and having considered it for a long time and discoursed with Gibbons about it," he ordered it to be carried into the queen's bedchamber, where the king admired it again, but being called away left Evelyn and Gibbons with the queen, believing from the subject she would have bought it; but she did not do so, so that Evelyn ordered the carved work to be removed back to the artist's "poor, solitary, thatched house in a field near Evelyn's house, Sayes Court, at Deptford, the artist having been a ship's carver." Evelyn goes on to say that this first known work of Gibbons was one which for curiosity of handling, drawing and studious exactness he had never seen in all his travels. The original painting he had himself seen at Venice, and brought home a copy of it, therefore was well acquainted with the subject on which the then obscure artist was at work. Evelyn, with a desire to serve him, inquired the price.

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Gibbons being, as he said but a beginner, valued it at 100*l.*, which the inquirer thought so moderate that the very frame was worth the money, there being nothing in nature so tender and delicate as the flowers and festoons about it, and yet the work was very strong. The piece, in alto and mezzo-relievo, had more than 100 figures of men, &c., in its composition. It was subsequently purchased for 80*l.* by Sir Robert Viner, Lord Mayor of London, whose name figures in Adam Littleton's seven storied line of his proposed inscription for the Monument, descriptive of the seven Lord Mayors in whose mayoralties it was begun, continued, and ended. (So says Elmes in his "Life of Sir Christopher Wren and his Times.") Grinling Gibbons was born of Dutch parents in Rotterdam, April 4, 1648, and died in Bow Street, August 3, 1720, and was buried in St. Paul's, Covent Garden; he lived for some time in Belle Sauvage Court, then on the west side of Bow Street, at the corner of King Street. When "discovered" by John Evelyn he was, as before mentioned, living as a ship's carver, "near Sayes Court, Deptford, in a thatched house in a field." This spot has now been given the name of Grinling Place. While in London he carved the ornamentation on the pedestal of Le Sœur's statue of King Charles I., at Charing Cross (re-erected in 1678), and of James II., now in St. James's Park, erected in the same year, by the same artist (Gibbons), and also the gilt cock of the well-known tavern of that name in Fleet Street. In 1867, Mr. W. G. Rogers, the eminent carver of Greek Street, Soho, read an exhaustive paper on "Grinling Gibbons" before the Royal Institute of British Architects, and which paper will be found in the architectural journals of that year. In this paper Mr. Rogers said:—"The peculiar description of light interlacing scroll work was originated by Gibbons, and is to be met with in most of his important works. It died out with him, and no one has successfully attempted to carry it on since his time." Mr. Rogers lamented the decay which had overtaken many of Gibbons's best works in different public buildings and private mansions which he had visited and described, with a view to their restoration and preservation. "It is a fact," he goes on to say, "to be stated with regret, that many of the most exquisite examples of his works to be met with are in such utter state of decay that unless something be done to preserve them there will shortly be nothing left to bear witness to the genius of Grinling Gibbons." Where his carvings are not being destroyed by the ravages of the worm, they are being ruined by the hand of the "house painter and decorator." Mr. Rogers then described the state of the carvings by Gibbons at Cassiobury, and at Trinity College, Oxford, where the fine ceiling and fittings of the chapel, "wrought in costly, richly, sweet scented cedar, is now covered over with a dirty undrying oil." Of course all this has now been rectified by owners and caretakers of Gibbons's works taking proper expert advice as to their preservation. We see an instance of this in the Vicar of Deptford St. Nicholas's Church, who has taken such good care of that wonderful piece of wood carving, the "Valley of Dry Bones," as I have already pointed out. While residing at Deptford, Gibbons was greatly employed by John Evelyn in decorating the houses he erected. Some good examples still exist in thirty houses in Albury Street, where are thirty canopies, beautifully carved in wood over the front entrance doorways and all carved differently, no two of them alike, no repetition. After his introduction to Sir Christopher Wren he was very extensively employed by that architect in St. Paul's Cathedral, and nearly all the City churches that were rebuilt by him after the Great Fire in 1666, and also at Oxford, Hampton Court, Windsor Castle, St. James's Palace, Burleigh and Petworth, Belton House, and many other mansions. Grinling Gibbons died in 1721.



THE PULPIT, ST. NICHOLAS CHURCH, DEPTFORD.

Sayes Court.

The manor of Deptford (sometimes called West Greenwich) was given by William I. to Gilbert de Magminot, or Maminot, whose great grandson, Wakelin de Maminot, dying without issue in 1191, this manor came to his sister Alice, wife of Geoffrey de Say (see Dugdale's Baronage). He gave it to the Knights Templars, but his son Geoffrey recovered it by giving the Templars the Manor of Saddlescombe, in Sussex in exchange (according to Dugdale). This Geoffrey having taken up arms against King John, his estates were seized and given to Peter de Cron. They were however restored by Henry III. in 1223, after which this manor continued in the family of Say till the latter end of the fourteenth century. William de Say died in 1375 possessed of it, leaving a son who died in his minority, 1382, and a daughter, Elizabeth, who became his heir, and married first, John de Falleslay, and secondly Sir William Heron, Knight. She died in 1402 (*see* Hasted), when Sir William Clinton and others, representatives of William de Say, were found to be his heirs. In the year 1414 Sir John Philip and his wife Alice held the reversion of this manor, Sir William Philip, his brother, being his heir. Edmund Mortimer, Earl of March, died seized of the manor of West Greenwich, alias Deptford, in 1425; and William de la Pole, Duke of Suffolk, in 1449. The duke's grandson John, Earl of Lincoln, who was possessed of this manor in his father's lifetime, was slain in the Battle of Stoke, near Newark-upon-Trent, in 1487, and his estates were forfeited to the Crown. King Henry VII. the next year gave this manor to Oliver St. John, whose son John died possessed of it in 1513, when it was inherited by his eldest son of the same name, then only eight years old. Leland in his "Itinerary" says:—"This young St. John's father, called (as I remember) Oliver, had given him a piece of land by Henry VII. of the attainted lands of the Earl of Lincoln, called Sayes Croft, lying in the meads towards Greenwich" (vol. vi., p. 19). It again reverted to the Crown before the year 1538, when Richard Long was appointed steward by King Henry VII. In 1547 Sir Thomas Speke had a grant of the office of steward for life. After the death of Charles I. it was seized by the Parliament. A survey of it was then taken, and it was sold to Thomas Buckner,

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Esq., in 1650, on behalf of himself, John Barsted, and others, the creditors of the State. Since the Restoration this manor has again vested in the Crown, and the stewardship of it has been held with that of Greenwich. Sayes Court, being the mansion house and site of the manor of West Greenwich, was for many years occupied by the family of the name of Browne. Sir Richard Browne died there in 1604. His son, Christopher Browne, Esq., succeeded him in the manor, mansion, and estates (demesne lands), being above 200 acres. When this was sold by the Parliament they assigned the site of Sayes Court to the Brownes, with about 60 acres, as a compensation for their interest in the whole. Mary, the only daughter of Sir Richard Browne, the younger, obtained in 1663 a lease of Sayes Court and the demesne lands for ninety-nine years. In 1726 the said estate was granted in fee to Francis Godolphin and others, in trust for Sir John Evelyn, Bart., whose grandson, Sir Frederick Evelyn, Bart., succeeded, and it still remains in the possession of the Evelyn family. Sayes Court (according to Lysons) was the residence of Sir Richard Browne, the elder and younger, and afterwards of Mr. John Evelyn, son-in-law of the latter, a gentleman very celebrated for his general knowledge and various accomplishments. He was particularly skilled in gardening, painting, engraving, architecture, and the science of medals, on all of which, as well as other subjects, he published many treatises. His most popular work was his "Sylva," which has gone through several editions. He wrote also on the "Art of Engraving," on "Medals," a "Philosophical Discourse of the Earth," "Acetiaria," or a discourse of salads, "Pomona," or a treatise on cider, &c. He also wrote a political tract in 1659 called "An Apology for the Royal Party." His work on "Medals" refers to one of the Duke of Argyle, who also became Duke of Greenwich (for being second in command at the battles of Blenheim, &c., under the great Duke of Marlborough). He was buried in Westminster Abbey where there is a monument to his memory. He left no issue, and the dukedom of Greenwich became extinct. He was the only person who held that title. Sir Richard Browne being absent at the Court of France, gave up Sayes Court to his son-in-law, who came to reside there in 1651. Being no friend to the then ruling powers, he spent his time in retirement at Sayes Court, studying the practical part of horticulture, gardening, and the culture of trees and the propagation of timber, which he has treated of in his great work "Sylva." His gardens at this place are said to have been the wonder and admiration of the greatest and most judicious men of his time. In the life of Lord Keeper Guildford, they are described as "most boscaresque, being as it were an exemplar of his 'Book of Forest Trees.'" What he most prided himself upon was a hedge of holly, which he thus describes with a great deal of enthusiasm in one of the later editions of his "Sylva," published by himself in 1704:—"Is there under heaven a more glorious and refreshing object of the kind than an impregnable hedge of about 400 feet long, 9 feet high, and 5 feet in diameter, which I can show in my now ruined garden at Sayes Court (thanks to the Czar of Muscovy), at any time of the year, glittering with its armed and varnished leaves; the taller standards at ordinary distances blushing with their natural coral? It mocks the rudest assaults of the weather, beasts, or hedge breakers:—'Et illum nemo impune lacessit.'" It is said that Peter the Great, Czar of Muscovy, to whom Mr. Evelyn lent his place at Sayes Court whilst he was studying naval architecture in the adjoining dockyard in 1698, used to amuse himself with being wheeled through this hedge in a wheel-barrow. Though the Royal tenant paid very little respect either to his landlord's trees or hedges, by Mr. Evelyn's description of his holly, and the exulting manner in which he speaks of its being proof against the rudest hedge breakers, it would seem that the Czar rather chose any other hedge than this for his amusement.

In the "Philosophical Transactions of the Year 1683" there is a letter from Mr. Evelyn giving an account, by desire of the Royal Society, of the damage done in his garden by the great frost of the preceding winter; but as his letter is dated April 14 little is to be gathered from it, as it is most probable that the cork trees and many others which he mentions as looking very suspiciously, recovered. He laments the damage done to his very beautiful holly hedge; but from the manner in which he speaks of it in 1704 it is evident that it was not very materially injured. A tortoise which had lived in his garden many winters would, it is probable, have escaped, but was found dead, having been obstructed by a vine root from burying himself to his usual depth. There is not the least trace now either of the house or gardens at Sayes Court; some of the garden walls only, with some brick piers are remaining. The house was pulled down in 1728 or 1729, and the workhouse was built on its site.

The Royal Dockyard, dating from the time of Henry VIII., was honoured by repeated visits from Queen Elizabeth, who here knighted Sir Francis Drake on his return from his voyage round the world. It was closed in 1869. In one of the walls are some remains of a Tudor brick window, dated 1513. Twenty-one acres of the site were bought by the Corporation of London for 94,640*l.*, and were at a further outlay of 230,000*l.* fitted up as a foreign cattle market. The old canteen of the dockyard, where Peter the Great while working here as a shipwright used to take his luncheons with other workmen, was preserved and fitted up, and converted into a tavern now called Peter the Great Tavern. A sculptured coat of arms, 1721, is on a building formerly used as a refrigerator. A tablet in Russian and English to Peter the Great was put up by Russian agriculturists, September 1901.

In conclusion I have to thank our members, Messrs. J. Downes and W. F. Harradence, for their assisting me in this excursion to Deptford. Mr. Downes first suggested it, and Mr. Harradence has been most painstaking and assiduous in finding out interesting nooks and corners to visit; and we hope you will not regret coming to see the places described, and hear something about men who in their time contributed towards adding to the greatness of old England.

GAS HEATING RESEARCH.*

(Continued from last week.)

THE third and fourth sets of experiments were with the same burner as in the second, but in the third set the gas consumption was raised, and the proportion of air to gas in the mixture largely increased. The flame was noisy, and the inner cone distinct and sharp. The width of the flame at its widest part was 35 mm. Its mean height was 160 mm., and the mean height of the cone 60 mm. For gas-stove practice, the flame was too well aerated. The gas consumption was 10.1 cubic feet per hour, and the calorific value 132.3 calories net at 60° Fahr., 30 inches, wet. The amount of heat radiated was 12.25 per cent.

In the fourth set of experiments, the amount of aeration was decreased, and, consequently, the size of the flame was increased. The inner cone was less distinct, and the flame was almost quiet. The gas consumption was 7.3 cubic feet per hour, and the calorific value 137.7 net at 60° Fahr., 30 inches, wet. The total heat radiated was 14.25 per cent.

It will be seen from these figures that variations in gas consumption—i.e., the size or volume of the flame—vary considerably the radiation efficiency, Helmholtz, with a very much smaller flame, having found its efficiency to be of the order of 5 per cent. It can also be seen that variations in the amount of aeration of the flame varies the radiation efficiency—the less the aeration the greater the efficiency, until a point is reached when there is no pre-aeration at all, a luminous flame is obtained, and the radiation efficiency is considerably increased, as will be seen from subsequent experiments.

When the flames are surrounded with fire-clay fuel, the heat is being conserved to the flame, and in all probability the flames themselves in a gas-fire are radiating more than without the fire-clay fuels.

It is probably safe to suppose that these flames radiate at least 16 per cent. of their total energy.

Radiation from Luminous Flames.

These determinations were made in a similar way to those with the non-luminous flames. A Bray's slit batswing burner was used having the usual steatite tip. In the first experiment, the gas consumption was 10.55 cubic feet per hour, and the calorific value 141.0 calories at 60° Fahr., 30 inches, wet. The percentage of heat radiated was 18.12 per cent.

In the second experiment, with the same burner, the gas consumption was 10.1 cubic feet per hour, and the calorific value of the gas 132.3 calories per cubic foot of gas, measured at 60° Fahr., 30 inches, wet. The percentage of heat radiated was 18.15 per cent.

In the reflector stove reported on in another section of this report, it will be seen that the percentage of heat radiated is 26 per cent. This is probably due to a better conservation of the heat of the flame and to the flame having relatively a much larger luminous area. The actual amount of heat radiated from the flames in this stove is likely to be well over

* Abstract from second report of the "Gas Heating Research Committee" appointed by the Institution of Gas Engineers in conjunction with the University of Leeds.

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30 per cent., as much of the radiant heat is absorbed by the fire-brick back and the copper reflector.

The Effect on the Radiation Efficiency of a Gas Stove of Varying the Gas Consumption.

In most of the modern types of open gas-fires, the fuel is arranged so that a column of fire-clay fits directly over each of the flames of the burner. The conformation of the inside of each column of fuel is usually such that the outer edge of the contained flame will be in contact with it. The aim of most manufacturers of the modern shapes of fuels is to present as large a surface of fire-clay as possible to the flame, the fuel having a minimum capacity for heat.

The larger the amount of combustion taking place while the reacting gases are in actual contact with the fuel, the higher will be the temperature of the fuel and the greater the percentage radiation attained, other conditions remaining the same. Should the column of fuel not fit the flame as well as it might—owing either to the shape of the fuel not conforming to the shape of the flame, or owing to the burner being out of centre with the fuel, or to the flame being too small, due either to an insufficient supply of gas or to a too large supply of air entering the burner—there must inevitably be much combustion taking place out of contact with the fire-clay, and the percentage radiation is consequently reduced.

Once it has been settled what type of flame is the most efficient from the point of view of its own radiation and from the point of view of efficiency of combustion, then the shape of the flame can be studied under varying conditions, and the fuel adapted to it. Perhaps it will be well to consider at this point a few of the factors that determine the shape of the flame, apart from mechanical conditions connected with the construction of the outlet of the burner. It is well known that different gases singly burnt under exactly the same conditions vary in the shape of the flame they give. The well-aerated hydrogen flame is long and narrow, while the carbon monoxide flame, although only requiring the same volume of air for its complete combustion, is wider and shorter.

If the amount of these gases in coal gas varies to any considerable extent, the shape of the flame will be to this extent affected. It is also a well-known fact that although the composition of the gas may remain constant, or approximately so, and although all other conditions may remain the same, a variation in aeration of the burner will produce at the same time a change in the shape and size of the flame. A well-aerated flame is short compared with a non-luminous but poorly aerated flame, which is long and cigar-shaped, the gas consumption having remained the same. The greater the supply of primary air, the smaller the flame.

The shape of the surrounding fuel itself is probably of as much importance in determining the shape of the flame as any other factor, especially when the flame is only partially aerated, as is usually the case in gas-stove practice. The air necessary for complete combustion of the gas has not as free a course to the flame when the flame is surrounded by fire-clay as when the flame is burning free in the atmosphere. As the fuel becomes heated up, the mixture of gas and air escaping from the burners, as well as the products of their combustion, will occupy twice to three times their original volume at atmospheric temperature, and the shape is still further affected. Nearly all these factors are determinable and controllable in the modern gas-fire, and the object of the following experiments was to determine to what extent the radiation efficiency of an open gas-fire is affected by variations in the gas consumption. The stove used was one of the most modern types having long columnar fuels. The burner was one that ensures good mixing of gas and air, and gave even flames. The air and gas were regulated to give a quiet flame showing an inner cone clearly but not sharply defined. The gas consumption for the stove was stated by the maker to be about 27 cubic feet per hour. If stoves are used with the gas adjustments as sent out by the maker (this is usually the case), then the gas consumption will vary with the pressure of gas at the stove, and it will be a matter of chance whether the adjustment be right for the particular mean gas pressure maintained in any particular district.

In the accompanying Table II. are given the results of five radiation determinations with the same stove working under the same conditions, except that in each the gas consumption was varied. In column A are found the gas rates, all reduced to 60° Fahr. and 30 inches of mercury, wet; and in column B the calorific value of the gas used—the gas volume (1 cubic foot) being also reduced to 60° Fahr., 30 inches, wet. Column C is the product of the gas rate and calorific value giving the total number of calories produced per hour in the stove; and column D shows the percentage of the heat that is radiated from the stove.

TABLE 2.

—	Gas Rate in Cubic Feet per Hour.	Calorific Value per Cubic Foot of Coal Gas.	Total Calories Evolved per Hour.	Percentage of Heat Radiated.
	at 60° Fahr., 30 mm. Mercury, Wet.			
	A.	B.	C.	D.
1	19·35	141·4	2733	33·1
2	25·31	136·2	3445	41·1
3	26·42	141·7	3743	41·5
4	30·96	136·7	4230	42·8
5	37·22	142·2	5368	38·6

It can be seen that a maximum radiation is reached when the gas consumption is 31.0 cubic feet per hour, and that if the consumption be increased or decreased the radiant efficiency is decreased. This is still more marked in stoves where a more open type of fuel is used than that in the stove upon which these experiments are based.

The percentage radiation depends more on the shape of the flame than upon variations in the calorific value of the gas used, except in so far as the calorific value influences the size of the flame. In other words, if the gas rate be kept constant and the calorific value of the gas varies, the variation in radiation efficiency is less than if the total calories in the stove are kept constant and the gas rate varied. In the first case, the size of the flame remains approximately the same, and in the second place it varies with the gas consumption.

A point of immediate practical interest arising out of this question is found in connection with the use of "Duplex" burners. After a stove has been burning for some time in a room, it is frequently found that, when the desired temperature has been reached, it may be maintained by turning the gas off a little. It is noticed, however, that lower than a certain consumption—usually about two-thirds of the full consumption—the radiant heating efficiency falls with the consumption, owing to the shrinkage in the size of the flame causing it to burn completely out of contact with the fuel.

To remedy this, the "Duplex" burner has been introduced. This gives a series of seven to twelve flames, some of which—usually the side ones—may be turned off, leaving the middle flames burning. The gas consumption varies with the number of flames lighted. In this way the size of the remaining flames remain unchanged, and although the gas consumption is probably the same as if the flames had been turned down, the radiant efficiency is much higher.

The following three experiments show this to be the case:—

—	Experiment.	Calorific Value 60° Fahr., 30 Inches, Wet.	Gas Rate 60° Fahr., 30 Inches, Wet.	Radiant Efficiency. Per Cent.
		A.	B.	C.
1	Seven burners full on ...	136·1	18·01	37·73
2	Seven burners turned down	137·4	9·62	30·74
3	Three middle burners full on	136·5	9·75	36·93

Care must be taken not to consider radiant efficiencies (column C) as amounts of radiant heat in considering these tables. By radiant or radiation efficiency is meant the percentage of the total heat evolved by the combustion of the gas in the stove that is experienced as radiant heat. The stove used in this instance was not one of the latest modern types, but nevertheless one that was quite satisfactory.

It will be seen from the table that when the seven burners are full on the radiant efficiency is a little higher than when only three are full on. This was to be expected, as the mean temperature of the incandescent surface of the "fuel" will be higher when seven burners are lighted and full on than the mean temperature of the surfaces of the three pieces of fuel within which three Bunsens only are burning. One flame radiates to another and increases its temperature, while the end ones largely radiate into space.

Varying Composition of Fire-clay Fuels.

So far very little attention has been paid to the subject of radiating materials used as "fuels" in the open gas-fire. Since the iron fret and asbestos fibre were replaced by fire-clay fuel the chief variations have been in the kind of fire-clay employed and in the shape of the fuel made from it. These two points are of the utmost importance, but there is a third point that is worthy of thorough investigation. The question

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must have occurred to everyone that if it is possible by means of a mixture of ceria and thoria of a certain composition to convert a part of the energy of a non-luminous flame into light as seen in the light of an incandescent mantle—having a selective effect on the radiations—is it not possible to find a material which will convert the energy of the flame into radiations of longer vibrations, consisting chiefly of heat radiations and a smaller proportion of light?

It is a well-known fact that black bodies radiate heat much more than lighter coloured bodies. They also absorb more. This would lead one to conclude that it would be an advantage to make the "fuels" of some black material. This would, of course, reduce the amount of light radiated from the fire, as, being a better radiator of heat, the fuel would be at a lower temperature than a worse radiator. This would detract from the brilliant appearance of the fire.

Iron "fuels" are known to be better radiators than fire-clay fuels if the temperature in each case is the same. If the same amount of heat is applied in either case about the same radiant efficiency is attained, as the iron fret will radiate its heat at a much lower temperature than the fire-clay.

Then the question of heat conductivity of material enters in. The "fuels" are heated up in air and not in a vacuum, and the higher the conductivity the greater the loss of heat to the air. If a better radiating material were found it would not be very difficult to improve the method of applying the heat to the material so as to raise its temperature to that of the usual fire-clay fuel.

There are two main courses of investigation open to those desiring to increase the radiant efficiency of a stove by modifications in the composition of the fuels. In the one, determination might be made of the effect of colour on the amount of heat radiated from the fuel, and in the other, the effect of varying constituents in the composition of the fuels bringing about a selective radiation for heat in somewhat the same way as the thoria-ceria mixture causes a selective radiation for light—apparently quite irrespective of the colour of the material.

(To be continued.)

IS WESTMINSTER CATHEDRAL BEING "UGLIFIED"?

By One Who Knows.

SINCE Bentley's death the work to Westminster Cathedral has never slackened. Admirers of that eminent architect, however, have had serious doubts whether his successors —or inheritors—are carrying on the work in the spirit of the pattern bequeathed to them. There seem to be serious mistakes as to propinquity of treatment, also as to the common laws of proportion. It will be said, perhaps, that some of these things are actual legacies from the original architect; but even so, he would have revised his design in the light of the completed building.

The Sanctuary or Choir.

When the fane was first revealed to the public all architects were impressed, and even enraptured, with the infinite spaciousness, the vast immensity of the dome, which seemed boundless and undefined. This effect has been completely destroyed by the suspension of the mammoth cross—some 30 feet high—which has introduced quite a false scale, and dwindled away the dome to nothing. In St. Paul's Wren made a similar mistake, putting a balustrade—which is some six or seven feet high—outside his dome, with the result of dwarfing the pillars of the dome For the eye, seeing this balustrade, supplies a human figure to correspond of about 20 feet high. So with a cross of 30 feet the human figure is assumed to be of the same dimensions. This, though Bentley's work, would have been subject to his revision.

The laying out of the details of the choir or sanctuary seems to have been haphazard or confused. The apse, which looks so noble on the outside as we stand under its shadow within becomes quite wasted or frittered away. Seen from the bottom, the space is all filled up with overgrown things. The baldacchino is a world too wide, and all but touches each side. The proportion of such a canopy should be regulated by the altar beneath. This is like an enormous church, and has a straggling air. It is plain that the "thrust" of the arch had to be provided for by the clumsy addition of the two hemicycle porches. The whole work is, indeed, richly stored with errors. A marble wall was carried across in front of the apse to support a gallery for the musicians, thus making two levels and abolishing the low floor of the apse—a prime mistake.

The arrangement of this gallery is most singular. In the middle a flight of stairs is carried up, not to the top level, but through it; and this flight is flanked by walls. The whole is thus fashioned into two galleries, or enclosures, and below each a sort of grille reveals a quasi-crypt. Why were not the stairs placed at each side?

The two colonnaded galleries are overgrown for the space, and with the baldacchino block up the whole. The pattern for these colonnades is found at S. Sophia, where they have the air of delicate suspended *cages* hung out, not of massive structures.

As soon as the baldacchino and the wall were completed it was found that the singers were looking down on the altar mysteries. So a rail and brocaded curtain were set up to close the open arch of the baldacchino. This destructive treatment converted a light and straggling building into a closed and heavy structure. Happily, after a year or so's experience this obstructing curtain was removed, and the heads of the choir boys are seen garnishing the top of the wall like rows of pigeons on the eaves of a roof. Again, why is the apex, &c., undecorated? There should be an open calix holding a cross at each foot of the triangle—an acorn-shaped ornament with balls over the pillar capitals. This poor baldacchino was to meet with further cruel usage; for had it been given fair play and left as originally designed it might have passed. The wall and other things built round or near its base seem to have cut off about a third of its height; otherwise had it been left detached, its columns springing direct from the ground, it would have gained a lightness and airiness, and even a height, which are now completely missing. Let the spectator only imagine the built-up wall away, and he will see what is meant.

It is really astonishing how an apse—always a sacred and interesting portion of a cathedral—a retired sort of chapel wherein monks in the past often said the divine office—should have been so ignorantly mauled and chopped about.

A great mistake is the wall separating the choir from the nave. This should have a plain simple barrier, rude and quite unadorned. It is part of the main structure. Instead it is broken up into recesses—"ambones"—garnished with mouldings and adorned with tablets holding pieces of marble framed, which seen from the bottom have quite the look of pictures hung on the wall. The sloping or chamfered sides to the steps have a weak air. A straight opening cut in the wall to admit the steps without flanks would have had a more stately effect. The three levels in the sanctuary are very awkward for locomotion. Three flights of six steps each have to be ascended before reaching the altar, so the ecclesiastics have to move about very carefully. On the whole, it is clear that the arrangements have not been distinctly planned beforehand—there is a confusion of ideas and intention.

The gamboge, or "yoke of egg," colour of the eight columns is not agreeable to the eye. We can see in one of the side chapels the original columns condemned and cast aside because three were fractured in transit. They are of an exquisite jasper—the tint lovely. They are, in fact, precious stones. And yet they could have been safely used; the sound ones placed in front, the others quite easily repaired, the pieces fastened with a steel stay. Even now they could be set up temporarily in the chapel where they stand (and noble attractive objects they are), one on each side of the altar arch.

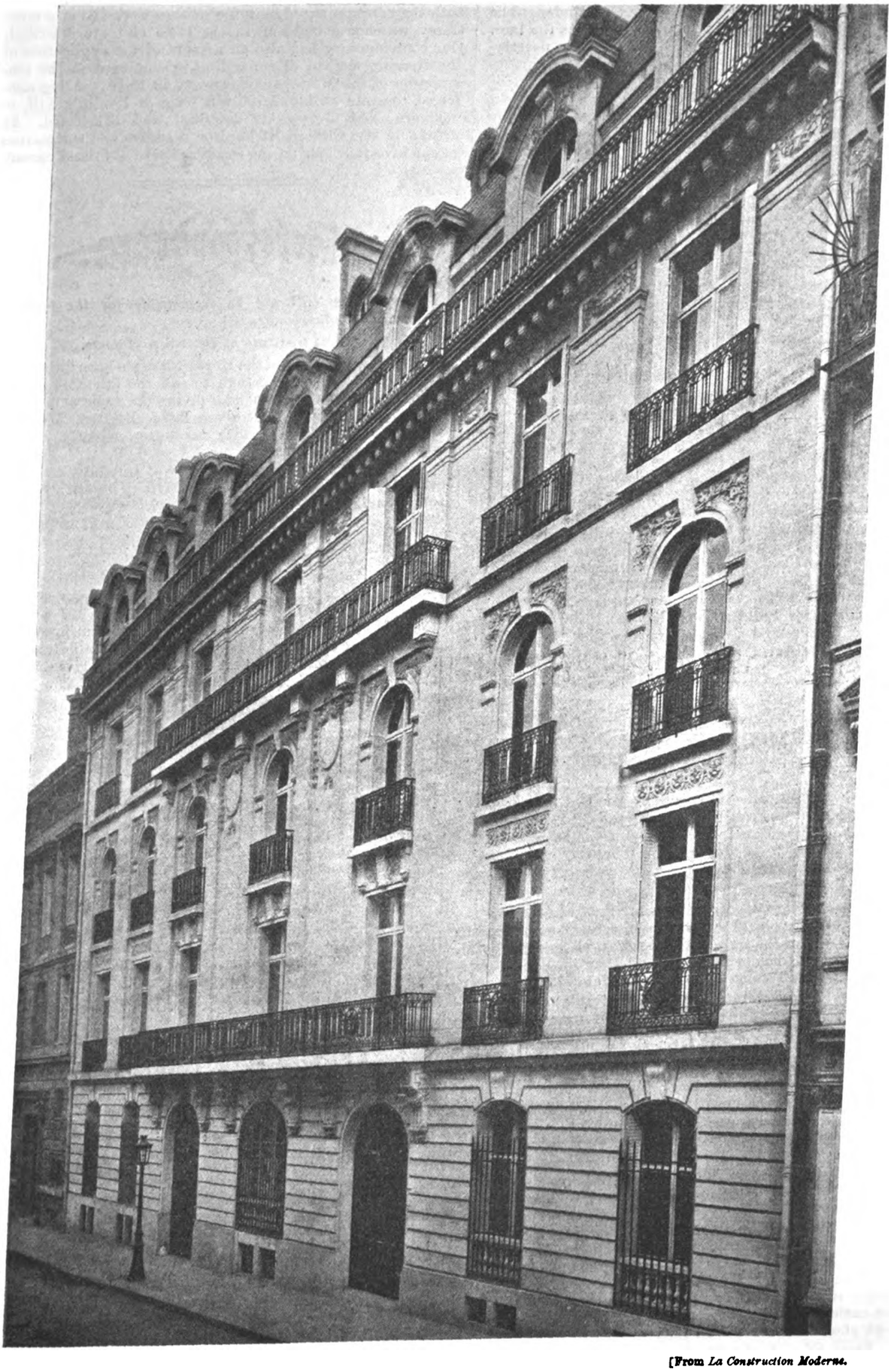
The colouring in the sanctuary is repelling and directed by no principle—greens, terra-cotta, white mixed together. All through the building the artists seem to have but one way of dealing with marbles—vertical stripes side by side. This is at best a mechanical formal method. Marbles should be blended together like the tints in ocean billows. In the Blessed Sacrament Chapel there are beautiful tints and fine treatment. The idea of taking a piece of ordinary marble and framing it in white mouldings is not decoration at all. We have seen lapis lazuli panels framed in ormolu with the richest effect, but that is a case of a precious stone. The vertical marble strips is an absurd suggestion drawn from wood panelling. But marbles, save in the shape of pilasters, do not lend themselves to that treatment.

The little chantry chapel in memory of Cardinal Vaughan has been rudely enough treated. Nothing is finer in Bentley's scheme than his handling of the "arch motive." There are usually two together, with a noble column between supporting, laterally, the vaultings of the chapel. It seems to bear all on its shoulders. The architects, however, fashion the two open arches into four small ones, and substitute an ugly pier for the columns. The effect is mean,

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MODERN EUROPEAN ARCHITECTURE.

FRANCE.



[From *La Construction Moderne.*

PREMIATED PARISIAN FACADE, 44 AND 46 RUE BASSANO.—MM. Le Nevé & d'Hont, Architects.

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particularly as the archings are wrought in an insipid white marble—which always makes a weak poor edging to an arch, though it may serve as wall material. It should have been of dark or black marble, which would have had a solid imposing air. All through there is a fancy for this poorly tinted material, which has "a cheap and nasty" air. The altar tomb of the Cardinal is hardly of the first order. The hands are of enormous size, being really as large as the face. The whole is too near the ground, and is very poverty-stricken in its effect. We would suggest that the figure be sent to one of the great electrotyping companies, who by their processes will clothe it in a complete suit of bronze a quarter of an inch thick. A course of stone, say six inches high, should be placed under the tomb, and these two simple additions would be a vast improvement. It is only fair to say that the new altars all round the church are pleasing and artistic.

A series of white framed tablets will be noted all down the nave, one on each pier. These are for "stations" in mosaic work. Now any one with even a glimmering of the laws of proportion can see that these are quite too large for the piers that carry them. The result is that there is a perversion of duty—the tablet seems to overpower the pier, and the latter is actually dwindled in size. It is like putting a large hat on a small man. Here, too, there is no "elbow room"; the tablet comes to the very edge. These are strange yet elementary errors.

We now come to what is really the most indefensible and wanton change—utterly unjustifiable on any æsthetic grounds. The handsomely-decorated chapel on the left as we enter—that of the Holy Souls—has been fitted with a gilt brass grille on the altar side going up to the crown of the arch. (This some irreverent person has likened to the Birmingham brass bedstead decoration.) To secure this trophy deep gashes were made in the graceful marble column which bears the whole vaultings of the chapel on its shoulders. Artists will see at once that this converts the column—or degrades it—into a sort of prop or "newell" to hold up the grille. It loses all its purpose on the instant.

These blemishes are pointed out not to find fault, but by way of warning to the ecclesiastical authorities. Else by-and-by this noble building will be found UGLIFIED (*vide* "Alice in Wonderland") beyond redemption. Possibly the writer has over-stated some things, in others he may be prejudiced; but he has the interests of this great fane at heart.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) deals in a leading article with contemporary church architecture as exemplified in two Catholic cathedrals, both by Mr. E. L. Masqueray, the Cathedral of St. Paul, at St. Paul, and the pro-Cathedral of the Immaculate Conception, at Minneapolis, both in the State of Minnesota. These are attempts "to obtain a Catholic cathedral in which the congregation may clearly see and hear," and are very fine conceptions.

La Construction Moderne (Paris) illustrates one of the typical performances of French architectural students, the "restoration" of the palace of Diocletian at Spalato, by M. Ernest Hébrard, holder of the Grand Prix de Rome, whose work at this year's Salon received the medal of honour.

Arkitektur og Dekorativ Kunst (Christiania) describes and illustrates an interesting timber house at Kongevillaen, by the architect, Kr. Biong. A competition for the laying out of an estate with blocks of flat-residences in the Mun Kedamsveien, is also illustrated, accompanied by the award of the jury.

Het Huis (Amsterdam) has an interesting article on the development of garden planning in Western Europe, in which, amongst other sources, Mrs. Evelyn Cecil's "History of Gardening" is laid under contribution. The old church of St. Peter, Arnheim, forms the subject of a short illustrated article. As an example of modern work are given illustrations of a villa at Roermond.

Construction (Toronto) gives a laudatory account, well justified by the illustrations, of modern domestic architecture in Canada, which appears to us to be based on both American and English work. By the way, we are told to note "the unique insetting of the red roof tiles in the stone arches" of one example. Is our contemporary not acquainted with the work of a certain Edwin L. Lutyens?

Stone (New York) illustrates as examples of stonework, the First National Bank, Hoboken, N.J., of which Mr. Kenneth M. Murchison is the architect, and a window of the Campanile at Florence, of which "the trim is of white marble."

Engineering Record (New York) deals with a subject that, though important, has not hitherto received much attention—the testing of the bearing power of soils under the foundation loads of heavy buildings. The tests made in connection with the new municipal building in New York and of a nine-storey warehouse building in the same city are described. Our contemporary has also an account of the application of the freezing method of tunnelling as employed in the construction of the Metropolitan subway in Paris. A big reinforced concrete viaduct 1,100 feet long, at Paulin's Kill, in northern New Jersey, is described and illustrated. An article by Mr. Clifford Richardson describes and summarises recent investigations on the constitution of Portland cement.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Royal Institute of British Architects.

SIR,—The Council of the Royal Institute have directed me to ask you to be good enough to call the attention of your readers to the fact that a man giving the name and address of Walter Browne, 21 Gresham Road, Brixton, S.W., has been in communication with tradesmen recently and has been making use of the initials "A. R. I. B. A." This man is in no way connected with the Royal Institute, and is not entitled to make any use of the initials in question.—Faithfully yours,

July 28, 1910. IAN MACALISTER, Secretary.

Intelligent Fire-Fighting.

SIR,—My attention having been called to your article of July 22, entitled "Intelligent Fire-fighting," I herewith desire to endorse the view taken, that the local fire brigade should be provided with suitable plans of buildings other than domestic ones, and that the plans should give some idea of the contents of the structures. The view that a definite system should be adopted regarding the description of the plans is excellent.

For some twenty-five years past the Berlin Royal Police Fire Brigade carry reference books on their engines showing (1) the exact position of all hydrants in that city; (2) the block plans of dangerous areas; (3) sketch plans of all public buildings; and (4) plans of all industrial buildings considered to have dangerous contents. I attribute a considerable part of the success of the Berlin Brigade in large fires to the use of these plans, combined with the fact that the local district officers make a point of personally inspecting buildings of a dangerous character at least twice a year, whereby they get valuable knowledge of the risks that have to be contended with.

As far as Great Britain is concerned, sketch plans of special value already exist of many buildings of importance, and these plans are so prepared as to plainly show those features that are of importance to the fire brigade.

I refer to the remarkable plans published by the late Mr. Charles E. Goad, for fire insurance purposes, which are the most perfect of their kind. The leading fire brigades should at least have these plans or similar ones, if they desire to properly understand the risks they have to deal with.—I am, sir, yours truly,

August 2. SEMPER PARATUS.

THE executive appointed to select a sculptor for the statue in granite of the late King Edward which is to be erected in Aberdeen are going to interview the following sculptors:—Sir George J. Frampton, R.A., Mr. Thomas Brock, R.A., and Mr. Alfred Drury, A.R.A.

MR. GEORGE AITCHISON, R.A., past-president of the Royal Institute of British Architects, of 150 Harley Street, London, aged eighty-four years, left estate of the gross value of 13,077*l.*, including 10,974*l.* in net personalty. Testator bequeathed 100*l.* to the Royal Academy Fund for Architects' Pensions, 100*l.* to the Royal Institute of British Architects' Benevolent Fund, his two University College of London prizes to the Royal Academy, his Royal gold medal (after the death of the survivor of trustees) to the Royal Academy of Arts.

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The Architect.

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THE A.A. ANNUAL EXCURSION.

IT might perhaps be supposed by a casual observer that the representatives of the architectural profession who attend the annual excursions of the Architectural Association are a company of somewhat senile valetudinarians, or at least of *malades imaginaires*, so frequently do they select for their headquarters one of the spas of England. Yet this week annually devoted to the study of architecture in the open is a real week of hard work and earnest study, and it is therefore but a coincidence that Bath, Leamington, Cheltenham, Matlock, and Tunbridge Wells should be renowned for their medicinal waters and at the same time excellent centres from which to visit admirable, and oftentimes to the ordinary traveller, inaccessible examples of English architecture.

Hence it is not surprising that the most important of England's inland watering-places of the present day, Harrogate, should be selected as a centre, although it is the first time in the history of the forty-one annual excursions of the A.A. that the town has been so honoured.

The members of the excursion gathered at Harrogate on Saturday last after various vicissitudes in travel, wherein, particularly, some lost their luggage, and some lost themselves in the bewildering network of lines that makes travelling in Yorkshire and Lancashire a puzzle to the Southerner and the Cockney with his reliance upon A.B.C. time-tables. There seem to be no radial avenues nor circumferential boulevards in the planning of the railways of England's great industrial district.

Sunday as usual was taken quietly, with short excursions and walks, as individual fancy prompted, the chief attraction being Knaresborough, with its castle, its church, its bridge, and its picturesque setting, all well known by illustrations. Others found an excursion over the moors to the reservoir of the Leeds Corporation a different type of scenery, with lesser known architectural attractions than Knaresborough, in the shape of a church and house, the former, Fewston, interesting from its rebuilding in 1697, clearly on the lines of an earlier mediæval structure, of which only the lower part of the tower, of early fourteenth-century date, with a few pieces of connecting masonry, remains. The house, Winsty Hall, is now the property of the Leeds Corporation, having been purchased as part of the estate forming the water impounding reservoir, and is, we regret to say, being allowed to fall into further decay and is not being preserved as it should be. From a date on a piece of evidently contemporary glass, 1627, the house is shown to be of interesting antiquity, whilst its design is a delight to all who can appreciate English seventeenth-century architecture. Originally intended to be of the usual E plan, Winsty appears not to have been completed to its original design beyond the central projecting porch, but to have received further additions on a more moderate and less costly scale. Hence it has gained considerably in picturesqueness, although it has lost something in dignity. We hope the Leeds Corporation will wake up to a sense of their responsibility as owners and take care to preserve this interesting and beautiful example of a moorland manor house.

On Monday, the first official day of the excursion, the programme commenced with a visit by rail to Ripon, where an hour was spent by the members in freely wandering about the city and sketching before meeting Dean FREMANTLE at the cathedral. On the way from the station to the city a halt was made at the picturesque but now disused chapel of the hospital or almshouses of St. Mary Magdalene, founded by Archbishop TURSTIN, or THURSTAN, early in the twelfth century, and rebuilt by Dr. HOOKE, Prebendary of Ripon and master of the hospital, in 1674. The chapel was altered at an earlier date in the Perpendicular period, and some of the woodwork of that time still remains. There is a stone altar remaining in its original position, and on the south side is a smaller slab in the floor which is supposed to have been that of an earlier altar.

Ripon Cathedral, though small, is one of the most useful that a student can visit, whether as an example of the historical development of English architecture or for its instructiveness in design. There are few buildings in which the treatment of the buttress as an element in composition can be better studied. Some examples of these can be seen in the views of Ripon given in our Cathedral Series as published in *The Architect* between January 3 and June 27, 1902.

After a short description by Dean FREMANTLE, the party were escorted, tourist fashion, over the cathedral and shown the Saxon crypt chapel, built by St. WILFRID, with its curious St. Wilfrid's needle, used for trial by ordeal. Although some fragments remain of the church built by Archbishop ODO or Archbishop OSWALD, and destroyed under WILLIAM THE CONQUEROR in 1070, and also of the succeeding building erected about 1080, the main lines of the present cathedral were laid down by Archbishop ROGER (1154-81), and followed by work under Archbishop DE GREY (1216-55), Archbishop JOHN ROMANUS (1286-96), with further work in the fourteenth century and the latter half of the fifteenth century, whilst the nave was rebuilt between 1490 and 1538. The three towers originally had spires, those on the western towers being 120 feet and that on the central tower still higher; but this latter fell in 1660, and the two western ones were then taken down for fear of a like catastrophe.

The earliest record we find respecting Ripon is about the middle of the seventh century, when a monastery was founded here by EATA, abbot of Melrose, in Scotland (the town at that time consisting of only thirty houses), which was subsequently given by ALFRED, King of Northumbria, to WILFRID, Archbishop of York, who not only improved the monastery, but by his patronage of the town very much increased its wealth and consequence. In the ninth century it was plundered and burnt by the Danes, and so complete was the devastation that only the remaining ruins denoted its former existence; it, however, recovered so quickly as to be incorporated a royal borough by ALFRED THE GREAT in 886, but it shared in the destruction which EDRED, in suppressing the insurrections of the Northumbrian Danes, carried through that province; and it had scarcely recovered from this devastation when it suffered from the unrelenting vengeance of WILLIAM THE CONQUEROR, who, after defeating the Northumbrian rebels in 1069, laid waste the country, and so effectually demolished this town that it remained for some time in ruins, and at the period of the Norman survey it lay waste and uncultivated. The monastery, after its destruction by EDRED, was rebuilt, chiefly by OSWALD and his successors, Archbishops of YORK, and

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was endowed and made collegiate by Archbishop Aldred about the time of the Conquest. Profiting by a period of comparative tranquillity Ripon had again begun to revive, when it was once more exposed to the ravages of war by the progress of the Scots, under Robert Bruce, in the reign of Edward II., who, after exacting from the wretched inhabitants all that could be wrung from them, destroyed the town by fire. Aided by donations from the Archbishop of York and the neighbouring gentry, and by the industry of the remaining inhabitants, it so rapidly recovered as to be selected by Henry IV. for the residence of himself and his Court when driven from London by the Plague; and the same calamity induced the Lord President of York to remove his Court hither in 1604. In 1617 James I. passed a night here on his route from Scotland to London, and was presented by the Mayor with a gilt bowl and a pair of Ripon spurs; and it was also visited by his unfortunate successor, Charles I., in 1633. In the great civil war it was taken possession of and held for Parliament by the troops under command of Sir Thomas Manleverer, who defaced and injured many of the monuments and ornamental parts of the church, and were at length defeated and driven from the town by a detachment of the King's cavalry under Sir John Mallory, of Studley.

In the market place, a spacious square, is an obelisk 90 feet in height, erected in 1781 by William Aislabie, Esq., on the top of which are a bugle horn and a spur rowel, the arms of Ripon.

After luncheon at the famous old Unicorn Inn the party drove to West Tanfield, the home of the historic Marmion family, where are the church of St. Nicholas and the ruined gateway of Tanfield Castle. These are picturesquely situated on the banks of the Yore, and form with the townlet a charming group. The present church has a nave and chancel built between 1340 and 1360, a western tower of 1400 to 1424, and a wide north aisle of about 1450, in which are the tombs of the Marmions and the chantries founded by Maud Marmion. Chief of the tombs, remarkable for the beauty of the alabaster figures and for the rare example of a still existing "herse" of wrought iron, is that of Sir John Marmion and Elizabeth his wife.

After an hour at West Tanfield the excursionists continued their drive to Kirklington, the church at which consists of nave with north and south aisles, chancel, western tower and north and south porches. The nave has an Early English arcade with Early Decorated clerestory, and the aisles and chancel are apparently of about the same date. The tower is rather a fine design from its lofty proportion and breadth of treatment. Perpendicular windows have been inserted at the east end of the chancel and in the west wall of the tower. The church contains a Jacobean pulpit, two fine recumbent early fourteenth-century figures of a knight and lady, some thirteenth-century incised tomb slabs, two aumbries in the east wall of the chancel and a double piscina in the south wall; but the most remarkable monument is that of Sir Charles Wandisford, who died in 1590, which bears some wonderfully executed heraldic shields of Wandesford — Wandesford impaling Fulthorpe, Wandesford impaling Bowes and Munsters, whilst a shield above the recumbent figure of Sir Charles bears the arms of Wandesford, Munsters, Colville, Conyers, Fulthorpe and Bland. A curiosity hanging on the nave wall is a funeral helm and gauntlets, the helm bearing for crest "a minster proper" for Munster.

From the church the party went to Kirklington Hall, the residence of Mr. H. B. McCall, the Secretary of the Yorkshire Archæological Society. This, though much mutilated in the eighteenth century, is an Elizabethan house of small size, dating between 1570 and 1574, with a very fine "grand chamber," which has a beautiful plaster ceiling and remarkably good panelling and mantlepiece. Next to this is another less elaborate but still pleasant and fully panelled room known as "the lord's chamber." There is also, more curious than beautiful, a powdering room. From Kirklington the party drove back to Ripon and so by railway to their headquarters at Harrogate.

On Tuesday morning the train was taken to Leeds, where the exigencies of time restricted the excursionists to the study of the church of St. John the Evangelist.

St. John's Church was consecrated by Archbishop Neale, September 21, 1634, and hence is a good example of a Laudian church. It was built at the cost of John Harrison, a rich merchant and Mayor of Leeds. On plan it consists of a nave and south aisle of equal width with a western tower at the end of the nave. There is no structural chancel, but a screen running the full width of the church forms a chancel and at the present day a morning chapel.

Originally the pulpit stood half-way down the nave and the pews faced half-east and half-west, and within the enclosure formed by the screen was a pew backing on to the screen and returned round the aisle for the use of communicants.

The church has been modified at several periods of its history, the chief occasions being in 1780, when extensive reparations were made; at about the middle of the nineteenth century, when Mr. Norman Shaw is credited with several alterations, including the cutting down in height of the pulpit, the removal of the sounding board, and the renewal of the east windows of nave and aisle. The west window of the aisle has at some time been altered from a Perpendicular type to a Decorated. This is by some supposed to have been done in 1780, but no architect would credit the date, and there is little doubt that this also belongs to the same epoch when the east windows received their present design, whether under the direction of Mr. Norman Shaw or earlier.

Mr. Shaw is also credited with the removal of the cresting on the screen, which has been, however, replaced by Mr. Temple Moore some six or seven years ago. He, however, has substituted for the Royal arms devices of a more ecclesiastical character. Mr. Moore has also restored the sounding-board to its proper position over the pulpit and has paved the church with red and white marble squares. The pews have lost their original carved doors and have been lowered in height, it is said by Mr. Moore, by whom the present choir stalls were designed.

Despite the alterations of 1780, of Mr. Shaw and Mr. Moore, the church remains a charming example of Carolean art. The arcade between nave and aisle with Pointed arches and Renaissance piers in brown stone well harmonises with the dark oak of pews, pulpit, screen, and roof. The roof, by the way, is in its setting out quite independent of the arcade, and appears to have been designed to suit the pattern of the plaster panelling between the principals. This is on reeds, and although the design in contiguous bays is uniform there are minor variations in execution which prove that they were modelled separately, whether *in situ* or not it is difficult to determine.

Although Leeds is now prominent as a manufacturing and commercial city, it has an interesting history. Anciently called Loidis, it was made a royal vill after the destruction of the ancient Cambodunum by Cadwallo, a British prince, and Penda, King of Mercia, over the last of whom, on his subsequent invasion of Northumberland in 655, Osweo, King of Bernicia, obtained a signal victory in the immediate vicinity of the town. During the reign of William the Conqueror, Ilbert de Lacy is supposed to have erected a castle here, which was besieged by King Stephen on his route towards Scotland, and in which Richard II. after his deposition was for some time confined previously to his removal to Pontefract; but there are no vestiges of it, nor can the site, which is stated to have been on Mill Hill, be distinguished by any traces of its previous existence. During the civil war in the reign of Charles I. many skirmishes between the contending parties took place in the neighbourhood, and that monarch resided for some time in the town in a mansion supposed to have been the first in that part of the kingdom that was built of brick, and from the colour of that material called the Red Hill.

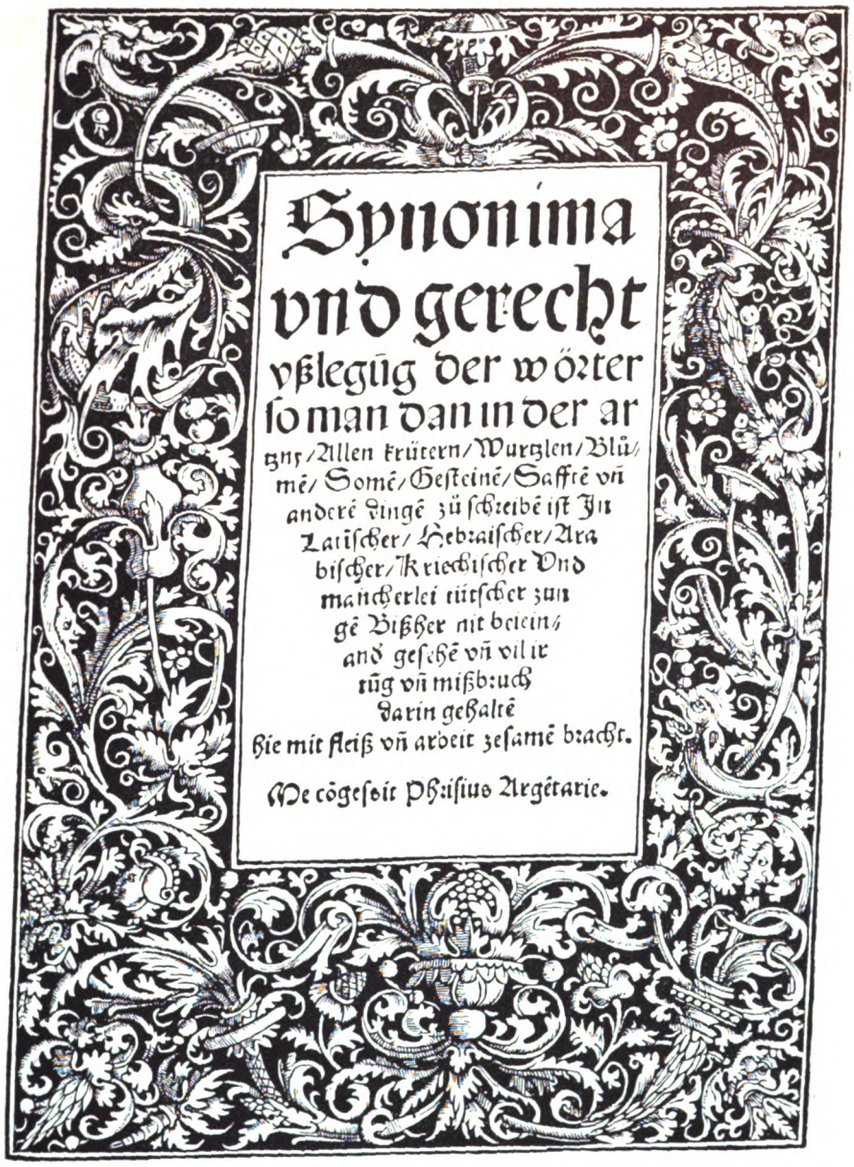
(*To be continued.*)

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NOTES AND COMMENTS.

WHILST we cannot but regret that by the decision of the Government we are to have no national memorial to King EDWARD VII., at least in the sense that it will not be carried out by those who profess to represent the nation, it is probable that the matter will be far better carried out than it has any chance of being done by our official Government. Mr. ASQUITH, in short, realises that he and his colleagues are not the best persons to manage a national affair.

THE Lord Mayor of LONDON, having received an invitation to take up the work of raising a Metropolitan memorial, has made his first step excellently well by the selection he has made of the representatives of London's



TITLE PAGE BY JOHANN GRUNINGER, OF STRASBURG, 1519.

many-sided life who have been invited to join the committee. Of course this committee, whilst adequately representative, will be too large for practical work; but it is important at the outset that the form of the memorial should be discussed and determined by a thoroughly representative body. Then the details can be settled by a smaller executive committee.

IT is not easy to decide the question of the form of the memorial and to distinguish between the merits of the various suggestions that have been made and will be made. The Crystal Palace, Buckingham Palace, St. Bartholomew's Hospital, King Edward's Hospital Fund, Hyde Park Corner, all have their advocates, but we fancy that the most generally acceptable scheme would be one that would combine utility with a distinctively memorial character to the personality of King EDWARD VII.

THE second number of the *Town Planning Review*, which, as our readers will remember, is the Journal of the Department of Civic Design of the Liverpool University School of Architecture, not only shows no falling off from, but is an improvement on, the first number. The professors of the department are beginning to feel their feet and to get a grip of the new subject—for England—of Civic Planning. The improvement of Liverpool is naturally a problem to which Professor ADSHEAD and Mr. JOHN A. BRODIE, Liverpool's City Engineer, would turn their attention, and accordingly the former deals with the remodelling of the central area and the latter with circumferential boulevards. Liverpool always strikes us with its incoherence and indefiniteness of plan that suggests a rabbit warren rather than a city and renders its geography exceedingly puzzling to a stranger. Therefore there is room for the earnest study of Professor ADSHEAD and Mr. BRODIE. Part II. of Modern Town Planning in England continues a review of "Garden City" schemes in England and Wales. Other articles deal with the Procedure Regulations of the Town Planning Act, schemes for the planning of Washington, U.S.A., Cathays Park, Cardiff, and Mr.

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Cass Gilbert's new plan for the University of Minnesota.

The fifteenth annual report of the National Trust for Places of Historic Interest or Natural Beauty records the acquisition of the Leigh Woods on the bank of the Avon, of the Coleridge Cottage at Nether Stowey, of the Morte Point Memorial Park, of the Goswell meadow at Windsor, of the marsh at Brasted Chart, of common land at Hindhead, of the preservation of the Cheddar Gorge and Whitgift's Hospital, Croydon, and of the securing of rights of navigation for the public on Derwentwater, a truly satisfactory record and justification for the Society's existence and claim to support. The objects on which the Society is now engaged, and for which they require funds, are the preservation of Borrowdale, of the picturesque sixteenth-century house at Worcester known as the Commandery, of the Geffery almshouses at Shoreditch.

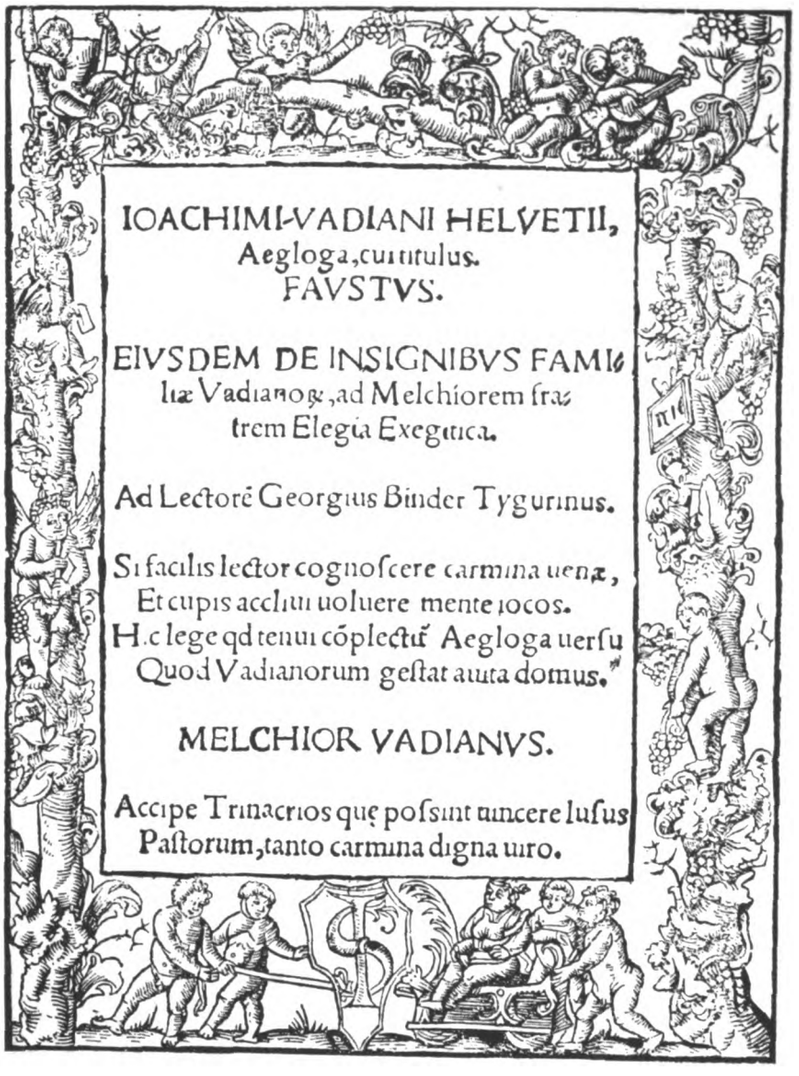
We noted some weeks ago the discoveries that had been made of the original foundations of twelfth-century work at Cholsey Church, Berks, and in a letter to the *Times* Mr. F. J. Cole describes further excavations which have led to the discovery of "the almost complete foundations of the south transeptal apse," from which he deduces the possibility "that the church might have originally terminated in three parallel apses." This is a type of plan that one might almost term normal in twelfth-century Western Christendom, but not very often found in evidence in England, and therefore this example at Cholsey is of particular interest.

BY-PATHS OF THE RENAISSANCE.

NOT alone in architecture and the arts and crafts connected with it did the influence of the Renaissance movement make felt its vital modification of the manner of thought and productions of designers. It extended to all the equipment and environment of life, and consequently there are many by-paths open for specialised investigation and exploration to the student of Renaissance design.

Inasmuch as the Renaissance movement in design coincided in point of time with the development of printing and the multiplication of books, it is not surprising that a very interesting by-path is to be found in the illustration of the printed volumes, and particularly in the design of their title pages, with which the early printers loved to adorn their productions.

A charming compilation* by Professor Dr. J. v. Pflugk-Harttung, recently published, gives 102 illustrations of sixteenth-century German title-pages, two of which, by the courtesy of the publishers, we are able to reproduce.



TITLE PAGE BY JOHANNES SINGRENIUS, OF VIENNA, 1517.

Not only as examples of skilful and artistic woodcuts, but as specimens of the draughtsmanship and design of some of the best artists of Germany in the sixteenth century, including such masters as Holbein, Dureb, Cranach, and Burgkmair, these accessories of Renaissance book-making take high place. There are in these title-pages, some quaint, some refined, a wealth of invention

* "Rahmen Deutscher Buchtitel im 16. Jahrhundert." Herausgegeben von Professor Dr. J. V. Pflugk-Harttung. (Stuttgart: Fritz Lehmann Verlag. 10 marks.)

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and, often, a keen sense of decorative effect that will give pleasure to the appreciative and suggestion to the designer.

Mythology, symbolism, heraldry, applied and abstract ornament are all pressed into service to furnish motifs for the remarkable variety of design to be found in the 102 illustrations selected by Dr. v. PFLUGK-HARTTUNG as examples of the productions of sixteenth-century German printers, ANTONIUS KOBERGER, JOHANN GRUNENBERG, and others. Needless to say, many of the title-pages before us are reproduced from the books of ERASMUS and MARTIN LUTHER.

ROYAL ARCHÆOLOGICAL INSTITUTE.

By OUR SPECIAL REPRESENTATIVE.

(Continued from last week.)

Tuesday, July 26.

Iffley.

IFFLEY CHURCH was reached by steam launch. As Mr. Harold Brakspear, who gave the description, remarked, the church is well known to all students of architectural history, and there is not very much to tell about it, as its history is best written in the building itself. The church is without aisles or transepts and consists of a nave, a central tower, and a chancel of two bays. The right of presentation to the living was given to Kenilworth Priory in 1160, and it is supposed the church was constructed shortly after. It is sometimes asserted that the original chancel ended in an apse; but with this view Mr. Brakspear said he could not agree. The principal evidence adduced is the existence of a round-headed opening at the back of the existing thirteenth-century sedilia, but this Mr. Brakspear thought was probably only a barrow hole. In the thirteenth century the Norman chancel was prolonged by one bay containing sedilia, a piscina and aumbrey. The light and simple vaulting of this addition makes a striking contrast with the elaborate work of the Norman roof. The next work was consequent on the demand for better light in the chancel; it was met by introducing Decorated windows of an early type. The same thing occurred later when Perpendicular windows were inserted in the deeply splayed Norman openings under the central tower in the nave. The only original windows left intact are those at the west end on either side of the font. But the ghosts of Norman work are everywhere to be seen. Much of it is unfinished; there are square blocks of stone still without their carving and jambs left perfectly plain. There is, however, a profusion of Norman carving. An unusual feature is the four columns of black marble introduced in the arches supporting the tower.

The font is of the same black marble. A similar font is to be found at Winchester and at one or two other places. The glass in some of the nave windows is partly original. The big circular window, with its elaborate Norman carving, in the west wall was considerably restored in 1860, when an inserted Perpendicular window was taken out. Mr. Brakspear noted as a curious point in construction that the staircase to the low central Norman tower has walls of not more than nine inches in thickness. There are two consecration crosses on the walls. The west door at Iffley with its six super-imposed orders is famous. Four of the arches are ornamented with the chevron and the other two have no caps, only a curious beak-head moulding. The so-called zodiacal signs in the hood-mould over were apparently introduced from memory by a carver who had seen the signs elsewhere and was unaware of their meaning. The south door is somewhat less elaborate. It is in a state of extraordinary preservation. This may be due either, as Mr. Brakspear maintained, to the fact that till 1820 it was protected by a porch or to a fairly recent restoration.

The Vicar mentioned that he had got into touch with the Society for the Preservation of Ancient Buildings in connection with some projected work at the church, as he regarded the building as a national rather than a local one.

Abingdon Abbey.

The journey from Iffley to Abingdon was made by steamer. In the latter town there were four things to be visited—viz. the abbey, the grammar school and council chamber, Christ's Hospital, and St. Helen's Church. All that remains of the abbey is the gateway, which faces the market-place, with its groined vaulting; the two-storeyed half-timbered dormitory; and the thirteenth-century crypt, with a *camera* over; situated at the end of the dormitory block. Mr. St. John Hope said that about the seventh century the site was occupied by a great abbey, the original arrangement of which is fully recorded in the contemporary chronicles. The abbey consisted of a large oratory or chapel about which were grouped the series of small houses, one for each monk. This arrangement was typical of many abbeys when first established in this country. There are also detailed accounts of the important monastery which succeeded it and of which so little now remains. The church was no less than 450 feet long and had three towers. A visitor to it in the fifteenth century put down a lot of particulars concerning the dimensions. The buildings of a monastic establishment might be divided, said Mr. Hope, into three classes—(1) those grouped round the cloister, (2) the infirmary, and (3) the buildings devoted to hospitality. It is the latter which formed the most important parts of the existing remains. In the dispensing of hospitality the cellarer played an important part, being in charge of one of the sides of the western cloister where the poorer class of guests were entertained. The poorest of all were accommodated in a separate building, which has been called by the late Mr. Micklethwaite "The Tramps' Guest House." The crypt in which the party assembled was, in the opinion of Mr. Hope, a part of the latter building. Its basement was something in the nature of a living room, as it was provided with a fireplace, the chimney shaft of which goes up the wall of the room above for a certain height and then ends in a slit. The crypt or basement might conceivably have been used as the cellarer's office or chequer, where he kept his accounts by means of an elaborate system of counters arranged in units on a checkboard. The room above Mr. Hope believed to have been another living-room, perhaps for the abbot. Its fireplace he considered to be one of the finest early fireplaces in the country. The big projecting hood has disappeared, and it is an open question whether it was of solid stone or whether it had a timber frame filled in with plaster. No less interesting than this building is the dormitory adjoining it with its continuous open gallery running the whole length of the block on the north side. This long building is remarkable for the scrupulous condition of cleanliness in which it is kept. On the upper floor there are a couple of cases of fossils. It may be regarded by the local authorities as a possible museum.

Christ's Hospital.

The various hospital buildings may be said to form three sides of a quadrangle with the church of St. Helen's making the fourth side. The main row of almshouses forms a picturesque brick and timber structure, the long straight front of which is charmingly broken about the centre by a projecting porch and a fine lantern over the trustees' room. The hospital was administered by the Guild of the Holy Cross, who maintained Abingdon Bridge and another one. The date of the constitution of this guild is uncertain. They were in existence in the reign of Edward III., and received a charter in 1441 from Henry VI. The Long Alley almshouses were built in 1446 for thirteen men and women. Two priests were appointed at an allowance of 1*d.* a week to sing Mass daily at St. Helen's. Henry VIII. granted leave for the guild to hold a yearly fair on the Feast of St. Andrew. In 1547 the guild was dissolved by Edward VI. and their possessions were confiscated. The hospital was refounded sixteen years later, when various alterations were made. Mr. H. Redfern, F.R.I.B.A., who explained the hospital's history to the party, suggested the present hall or guild room was made or, at any rate, remodelled at that time. He was uncertain whether the cloister woodwork is of the same period or whether it is part of the original structure. In either case it makes an interesting comparison with the open gallery of the abbey dormitory to which allusion is made above. Pepys visited the building in 1668 and was much impressed by the structure itself, the portraits of the founders, and the books. On leaving he tried to give 2*s.* 6*d.* to the inmates, but as they would not take it he put the money in the box—which box is still in the hall.

St. Helen's Church, Abingdon.

This church possesses the uncommon characteristic that it is broader than it is long; this is due to the fact that it consists of five parallel aisles. The oldest parts of the church are the tower and the northernmost aisle (called the Jesus aisle) which date from the thirteenth century. The adjacent aisle of Our Lady followed next, the roof of which was erected in 1390; then the present centre aisle dedicated to St. Helen. The two aisles to the south—viz. St. Katherine and the Holy Cross—were built to meet the demand for more accommodation caused by the suppression of the abbey about 1530. The spire which was erected over the tower in the fifteenth century was rebuilt in the time of Charles I. This

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work is said to have been done by Christopher Kempster, clerk of works at St. Paul's Cathedral under Wren, who also rebuilt the spire of his native Burford. The spire was again taken down and rebuilt in 1886.

Sutton Courtenay.

The first place visited in this village was described in the programme as "The Norman Hall." The most interesting part of this building is a late twelfth-century structure with a very rich doorway, c. 1200, a Tudor fireplace, and an inserted screen which was originally either in the hall or the chapel. Mr. Harold Brakspear, Mr. C. Lynam, and Mr. Hope were all of opinion that it served as a chapel. The chief reasons for this view are the arrangement of the windows, the placing of north and south doors directly facing each other, and the isolation of the building. The owner, however, was convinced that the building had served as a hall.

The first three stages of the western tower of Sutton Courtenay Church belong to the twelfth century, and the fourth to the fourteenth century. The chancel, with its small lancet slits, is thirteenth century. The nave is fourteenth century, as were also the aisles, though the latter were afterwards widened and raised, the original small windows being taken down and inserted in the nave clerestory. On the north wall there are the remains of a tempera painting of St. George and the Dragon. The furniture includes a fifteenth-century rood-screen and parclose screens in the aisles. The south porch was erected in brick about the reign of Henry VIII., with a half-timber parvise over. It protects a fine doorway and a holy water stoup of Purbeck marble.

Sutton Courtenay manor house is a very complete example of a fourteenth-century house. The hall, with its original open-timber roof, runs through two storeys and is flanked on either side by apartments on two floors. The kitchen offices were later removed from the south end of the hall to the back. The withdrawing-room and solar on the north remain. Mr. Hope gave an explanation of the general arrangement in mediæval times of manor houses.

Wednesday, July 27.

Broughton.

The church at Broughton (twenty miles north of Oxford) is an interesting one and a beautiful one; but as Mr. Hope, who described it, remarked, there is not very much of an architectural story to be made out of it, as the structure has the characteristic, somewhat unusual in this district, of being practically all of one date. The tower with its spire, the nave, the chancel with its stone screen, the south aisle (there is not an aisle on the north), and most of the windows are all of the beginning of the fourteenth century. The principal exceptions are the nave clerestory, the large window in the south wall of the south aisle, and the introduction of a clerestory in the same wall, somewhat earlier than that in the nave, and the roof of the nave which was put up in 1684. At the time the church was built the owner of the adjacent mansion was Sir John Broughton. He is responsible for the erection of the south aisle, which became practically the family chapel. He died in 1306 and was buried here in the multi-coloured recess in the south wall. Between the aisle and chancel is an altar tomb with an effigy of a knight on it. This is original, though together with the other monuments it has been badly scraped and restored. Like the earlier figure in the south wall, he is in armour. In the chancel there is an elaborate altar tomb of Sir Thomas Wykeham and Elizabeth, his wife. He was the great-nephew of William of Wykeham, and received from him Broughton Castle, which had been purchased by the Bishop from its first owners. The tomb necessitated the south chancel wall being broken into and a recess with an elaborate canopy made. It was through this lady that the castle came into the possession of the Fiennes family. The front of her tomb was partly destroyed for the purpose of placing the husband's alongside. The head-dress, with its jewelled ornaments, is interesting. Round her neck is the Collar of S.s., while round his is a collar of suns and roses. Mr. Hope explained that the Collar of S.s was a Lancastrian order, and that the "S." was the initial letter of "Souverain," the favourite motto of King Henry IV. This had, he said, been often guessed at, but he was fortunate enough to find in the Record Office a half-burnt bill for making a certain number of collars formed of letters of S, each pounced with the word "Soverayne." Another altar tomb is the double one of William Fiennes, first Viscount Saye and Sele (nicknamed "Old Subtility"), who died in 1662, and his wife. Its upper part consists of two black slabs. The elaborate sedilia have been practically reconstructed with fragments. One of the sights of the church is the stone screen. The plainness of the stonework on its western face below the arcade is accounted for by the fact that an altar stood in front on each side. The arcade was not quite as open as at present, as may be concluded from the fact that in between the stone uprights there appear the stumps or the holes of an iron grate. The font is of Norman date with a cable moulding, and presumably came from the eleventh-century church that once stood on the site. There are two good brasses at the east end of the south aisle dated 1414 and 1666, and not far away a mural monument to two Fiennes who died in infancy. The paintings on the walls were defaced about the reign of Elizabeth by placing over them texts from Scripture.

In the chancel there was a painting showing the Annunciation and the Coronation of the Virgin, of which the following legend remains, "Leuedye for yi joyes fyve led me ye way of clen [e, life]." Over the chancel arch there was at one time a large painting of the Doom; this was destroyed by a former rector. In 1846 works of reparation were carried out, and a very detailed account was made as to what was done to the monuments. At the same time casts were taken of the heads of four of the effigies before they were touched. They are now shown in a case and show a considerable amount of vitality and characterisation. The then vicar, who made the account, wrote, "Restoration is destruction. A monument restored is a monument destroyed." On the outside the eye is attracted by the fine west tower with its broach spire and door below showing the ball-flower; the water spouts carrying the rain from the roof and projecting sufficiently away from the wall to send the water beyond the foundations; a curious window over the sedilia, which is practically divided into two by a heavy centre mullion in the double triangle in the window head of the south aisle.

Broughton Castle.

Entrance to the castle was gained by crossing the wide moat surrounding it. For further defence there was a gatehouse which stands at some distance from the castle. Here Mr. Hope delivered the initial part of his description. This gatehouse belonged, he said, to the same date as the main structure of the church and of the house itself, with the exception of the inner wall facing the house, which was a century later. This might have been due to the arch tumbling out, or other cause. When rebuilt it was given an extra thickness. The plan is somewhat unusual, as there were doors originally in the middle as well as in the outer arch. The gatehouse was approached by a bridge, part of which drew up in the manner of a drawbridge. The original site of the house was only half the size of what it is now, as is shown by the way in which the buildings sit upon it, and also by the remains of the battlemented wall which starts from the gatehouse. The present moated enclosure probably surrounded first the Saxon homestead, secondly the more permanent buildings which replaced it, and lastly the present house as set out by the De Broughtons about 1300. A century later the property was acquired by William of Wykeham, who left it to his great-nephew Sir Thomas Wykeham. This owner was granted permission to crenellate. The moat must have flowed right up to the house on the east side, as the walls are of no height and evidently rose sheer above the water. On the east side of the gatehouse there is a block of stable buildings which is also part of the additions by Sir Thomas Wykeham. The house used to be enclosed by another wall, which has since been cleared away.

The chief point of interest, said Mr. Hope, when the party came to a halt facing the main front, was the curious way in which the fourteenth-century house was made in the sixteenth century into a symmetrical building. The walls of the great hall are for the entire length fourteenth-century work. The Elizabethan work was carried out by the Fiennes in the second half of the sixteenth century. On the south front it includes the oriel window over the middle buttress, the two bay windows of six lights each (one of these bays is a sham, as it is really the entrance), the third storey, and the kitchen block. An unfortunate feature of the Elizabethan period, said Mr. Hope, was their desire for symmetry as opposed to nice irregularity. The important fact to remember in connection with the interior of the house is, said Mr. Hope, that two-thirds of it is fourteenth-century work, and the rest dates from 1554. The hall was not originally cut into two by a ceiling; at the time of its erection it was open to the roof. The entrance was presumably through a door on the site of the existing window and under the gallery at the west end of the hall. Beyond the west wall was the original buttery and pantry, which is now used as a boudoir, and beyond that again stood the kitchen and offices, which, like the gallery, have been entirely swept away. At the east end of the hall was the customary daïs with a withdrawing-room at the back approached by a remarkable

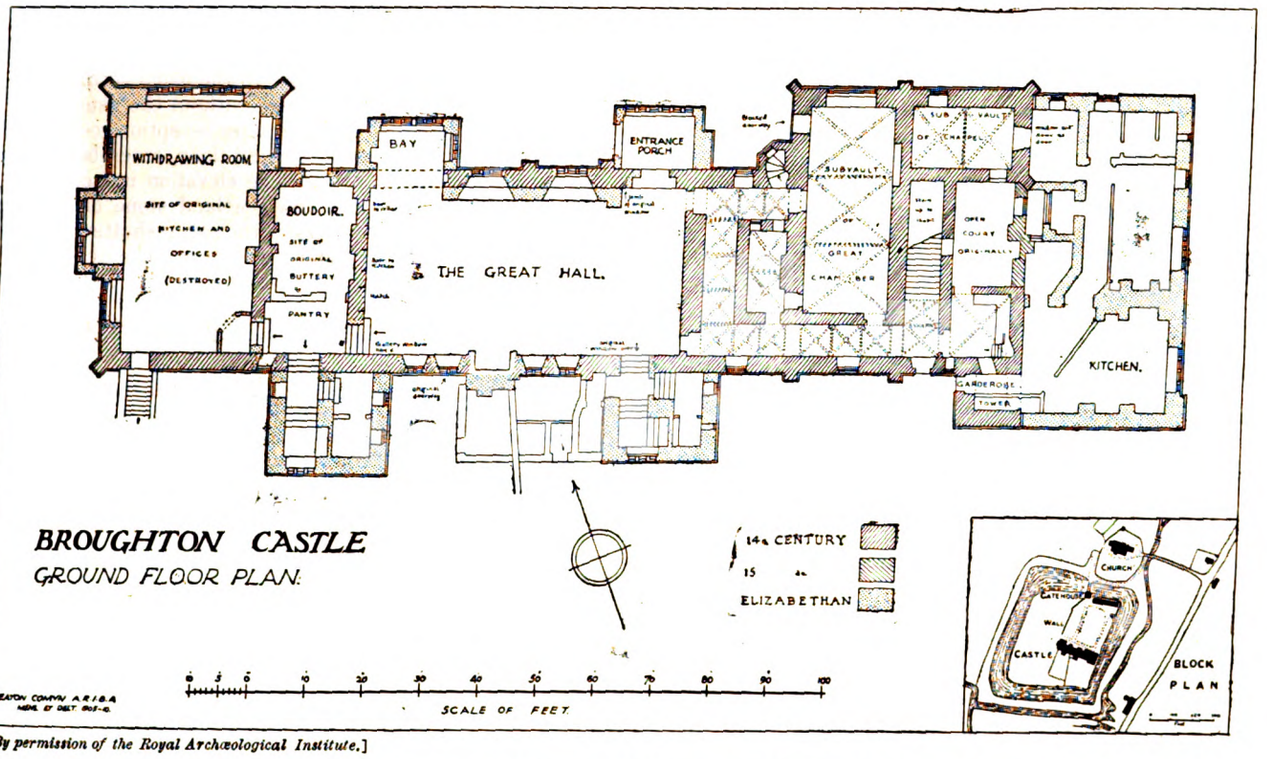
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vaulted cloister. Owing to the subsequent alterations, most especially in the re-erection of the kitchen in this part of the house, it is a matter of speculation as to how the first kitchen block was arranged. The customary fourteenth-century disposition of a domestic building was here carried out on an unusually large scale. The chapel was attached to the main block at its north-east corner, and a corresponding block existed to the south-east of the hall.

The Elizabethan alterations rendered the plan a symmetrical one. They, among other things, brought the kitchen from the west end to the south-east corner, where they were compelled to abandon the usual square plan owing to the presence of the moat. On the site of the fourteenth-century kitchen a two-storeyed building with fine plaster ceilings was erected. The story of the buildings may therefore be traced from the time of their erection by Sir Thomas Broughton, through the alterations made by Sir Thomas Wykeham, and later by the Fiennes in 1534. Since that time no important changes have been made in the house, with the exception of the insertion of a fine plaster ceiling in one of the upper rooms in 1599. The present tenant, Lord Algernon Gordon-Lennox, has been at considerable pains to do his best by the buildings.

Bloxham Church.

Although this village never played a prominent part in the history of Oxfordshire it possesses an imposing church. The most conspicuous feature of it is the tower and spire, fine set of heads as corbels. The design of the clerestory windows is very effective. In place of a south transept there is the Milcombe Chapel, belonging to the Thorneycroft family of Milcombe; the design of its bases and caps on plan should be noted. The font is a good Perpendicular one with a Jacobean cover. In the south aisle there is a remarkable alms-chest formed out of a single tree trunk. The heavy lid, which is from a different piece of wood, is fastened by seven locks. A second and larger chest, though not nearly so well protected, is under the west tower. In the south aisle there is a curious doorway or window leading from the priest's chamber over the porch into the church. This porch shows good Early English work in its lower storey and there are two Perpendicular rooms above. The interior of the church retains various remains of frescoes, including a portion of a St. Christopher over the north doorway, part of a "Doom" over the chancel arch, and a fresco between the south windows of the Milcombe chapel. There are also parts of the old rood-screen with original paintings of the Evangelists on the lower panels. The party after inspecting the interior made a tour round the church on the outside. Mr. Allfrey drew particular attention to the grouping of the tower and spire, which rises to a height of 198 feet, the arrangement of the pinnacles with the octagon at the base of the spire being extremely happy. A Sanctus bell was provided over the west end of the Milcombe chapel and another over the chancel. On the outside there are several figures or parts of figures, especially noteworthy being the band



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which is one of a triangle of church spires characterised thus locally:—

Bloxham for Length,
Adderbury for Strength,
King's Sutton for Beauty.

Except that the lines might be construed as giving a monopoly of beauty to King's Sutton they may be taken as apt. Mr. E. W. Allfrey, who acted as leader, thought that the original church dated from about 1160. Of this very little remains, the principal existing parts being a portion of the south doorway, the very fine mouldings of the south windows in the chancel, and a small doorway on the north side of the chancel leading into a vestry. The church was apparently rebuilt about 1220. Of this the nave arcades remain, the south arcade with its traces of colour being a little later. The south chancel windows are Decorated; it appears as if the Norman windows were used up in their construction. The north transept is Decorated with a very fine Perpendicular east window. Mr. Allfrey also drew attention to the extremely beautiful shaft and capital dividing this transept from the north aisle. It seemed, he said, as if here, as at the neighbouring Adderbury, the carvers had concentrated their ornament on to that shaft. At Adderbury, however, there are two such elaborate capitals, one on the west side of each transept. Both aisles with their timber roofs are Decorated additions; the south aisle has a of figures round the north aisle. Over the west doorway is a sculptured representation of the Last Judgment, showing the twelve Apostles and Christ.

Adderbury Church.

For the best first impression of this church the visitor should follow the churchyard path leading to the priest's door on the south side of the chancel. This enables the grandeur of the fifteenth-century chancel windows to be adequately seen, and on entering the building the first object that attracts the eye is the rood-screen with its spacious loft. The latter may not be entirely original and it may be unwise to accept implicitly the common belief that the chancel was erected by William of Wykeham. Nevertheless the effect of both these outstanding features is so pleasing that it seems ungrateful to insist on absolute certainty. The oldest parts of the church are Early English. Mr. Allfrey suggested that when a Perpendicular clerestory was added to the Early English nave arcades they raised and rebuilt the still existing Decorated roof, which is carried on carved corbels. A curious feature of the clerestory windows is that they were continued across the two transepts at apparently a later date than the others in the nave. There are two recesses in the aisle walls which were probably tombs. There are two beautiful slender shafts leading from the transepts into the aisles; that on the south

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has a carved cap representing four knights with arms intertwined, that on the north shows four ladies. On the south side of the chancel is a well-worn staircase leading to the rood-loft. The lower part of the screen up to the vaulting is original. The chancel is, as already mentioned, usually attributed to William of Wykeham. It is certainly an exceedingly fine piece of Perpendicular work. The design of the fine windows is credited to Sir G. Scott, who had to proceed without any clue as to the original tracery. Mr. St. John Hope doubted whether the chancel could be attributed to the great Bishop, in spite of the fact that it bears his arms, inasmuch as he died in 1404, which was some time before the "Collar of 'S.s'" carved on one of the corbel figures came into general use. The exterior of the building shows some notable carving on the two sides under the aisle parapets. The thirteenth-century tower and spire compares for beauty, at any rate, rather badly with Bloxham and King's Sutton. The north porch has a priest chamber over and in it is the unusual feature of a window facing east. Close to the church is the tithe-barn, c. 1380, now used as a gentleman's stables.

(To be concluded.)

ILLUSTRATIONS.

CARVED CABINET.

THIS front, by Mr. Mark Rogers, of a corner cabinet in oak, shown recently at Carpenters' Hall, was previously at the Grafton Galleries Arts and Crafts Exhibition. The head in the centre was adapted from a plaster study shown some few years ago at the Royal Academy. The sculptor thinks the door has not framing enough, and will probably re-arrange it in making that correction. The rather violent grain of the wood has been objected to by some critics, but it is open to question whether that is not in some respects to the advantage of the work, and in any case it will become less apparent with age.

CLOCK CASE IN CHESTNUT WOOD.

THE clockcase is intended to form carved decoration in the panel over a chimneypiece, and is made in chestnut wood as giving a grain like oak without the strong markings that would interfere with the delicacy of rather small detail. The inscription surrounding is from the Vulgate, "This is the day which the Lord hath made; we will rejoice and be glad in it." Day and night are suggested by the sunburst and stars, with time, the serpent of eternity, youth, age, and death round the dial. It was shown at the recent exhibition at Carpenters' Hall, and at a previous competition, though then unfinished, gained the gold medal of the Carpenters' Company. It is the work of Mr. Mark Rogers.

FAWLEY CHURCH, BERKS., WEST WINDOW.

AWAY some miles from Wantage at Fawley is a pretty little modern church designed by Street, replacing an old church which became ruinous. Our illustration of the design for the glass in the west window is taken from the water-colour sketch by Mr. Arthur A. Orr in this year's Academy, the subjects in the principal panels being "The Madonna," "The Good Samaritan," and "The Good Shepherd," while a smaller series of panels at the base contain angel figures of Justice, Honour, Truth, and Power. The figures were simple both in colour and treatment, each figure having two tones of the same colour only, and the whole of the groups were placed on the palest of Norman slab glass. Two of the cartoons were exhibited last January at the Arts and Crafts New Gallery.

WINDOWS AT THE VISITATION CONVENT, HARROW.

THESE two small windows were designed for the cloisters of the Visitation Convent, Harrow, and represent the first manifestation of the Sacred Heart to Longius, the centurion, and the apparition of the Sacred Heart to Blessed Margaret Mary.

The illustration is from the water-colour design in the Academy of this year. One cartoon was also exhibited in this year's Arts and Crafts Exhibition at the New Gallery.

Both these windows and that at Fawley were carried out throughout by Mr. Arthur A. Orr, of Harrow, and under his supervision, in the glass studios of Mr. Arthur J. Dix, of Gower Street.

NO. 41 HARLEY STREET, W.

THIS house was erected by Messrs. James Smith & Sons, builders, of South Norwood, from the designs of Mr. W. Henry White, F.R.I.B.A., of No. 14a Cavendish Place, W. The plan was carefully adapted to a limited site, and contains several fine reception rooms, nine bed and dressing rooms, two bath rooms, and a full complement of servants' offices and service lift. The elevation is in Portland stone with green Westmoreland slates for the roof. The illustration is from a drawing exhibited in the Royal Academy in 1908.

NO. 1A UPPER WIMPOLE STREET, W.

THIS house was erected by Messrs. E. Lawrance & Sons, builders, of Wharf Road, City Road, N., from the designs of Mr. W. Henry White, F.R.I.B.A., of No. 14a Cavendish Place, W. The site is somewhat unique for a town house, having a considerable frontage and little depth, but the plans provide for all the usual accommodation of the terrace type of house, without the usual staircase of many flights. There are three reception rooms and a good panelled hall on the ground floor, seven bedrooms and three bath rooms over. The elevation is faced with T.L.B. cherry-red bricks and Portland stone dressings, and iron casement windows with green shutters. The roof is covered with red sand-faced tiles. The illustration is from a drawing exhibited in the Royal Academy in 1908.

The Society of Architects recently sent a congratulatory address to His Majesty King George V. on His Majesty's accession to the throne, and the following reply has been received from Mr. Winston S. Churchill:—"Sir,—I am commanded by the King to convey to you hereby His Majesty's thanks for the loyal and dutiful address of the President, Council and Members of the Society of Architects, expressing their congratulation on His Majesty's accession to the throne. His Majesty has expressed pleasure at the beauty of the Society's address."

Mr. Edward Robert Robson, F.S.A., F.R.I.B.A., F.S.I., being now free from all public appointments (except that of architect to the Royal Institute of Painters in Water Colours), has taken as junior partner Mr. Joseph Harold Gott. The practice will henceforth be continued under the title of E. R. Robson & Gott, at Palace Chambers, 9 Bridge Street, Westminster, S.W.

At a meeting last week of the Gelligaer Urban District Council, at Hengoed, a letter was read from the Local Government Board stating that they would arrange for a local inquiry into the application of the Council for sanction to borrow 110,000*l.* for constructing a sewer and sewage disposal works. The Council also considered the architect's amended estimate of the cost of the isolation hospital, and a resolution was passed that the Council apply for sanction to borrow the necessary money for the erection of the hospital, which will cost over 10,000*l.*

Mr. H. S. Gamley, A.R.S.A., sculptor, Edinburgh, has prepared a model of the memorial to be erected in East Princes Street Gardens, Edinburgh, to Mr. J. B. Dunlop, the inventor of the pneumatic tyre. The memorial will stand upon a raised platform architecturally treated with flights of steps leading down on either side to form an enclosing crescent. It will be surmounted by a classic female figure seated on the globe, her right arm resting on an ornamental motor wheel, emblematic of its universal use over the world. Speed is indicated by a figure of Mercury held in the left hand. Round the base are four cupids supporting wreaths. The plinth will also have an alto-relievo head of Mr. Dunlop, with an inscription plate below. The sculpture work will be in bronze, and the architectural work in specially selected freestone. The memorial is estimated to cost 3,000*l.*

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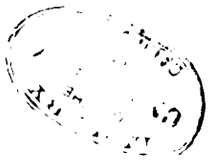


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PART FRONT OF A CORNER CABINET IN OAK

By Mr MARK ROGERS

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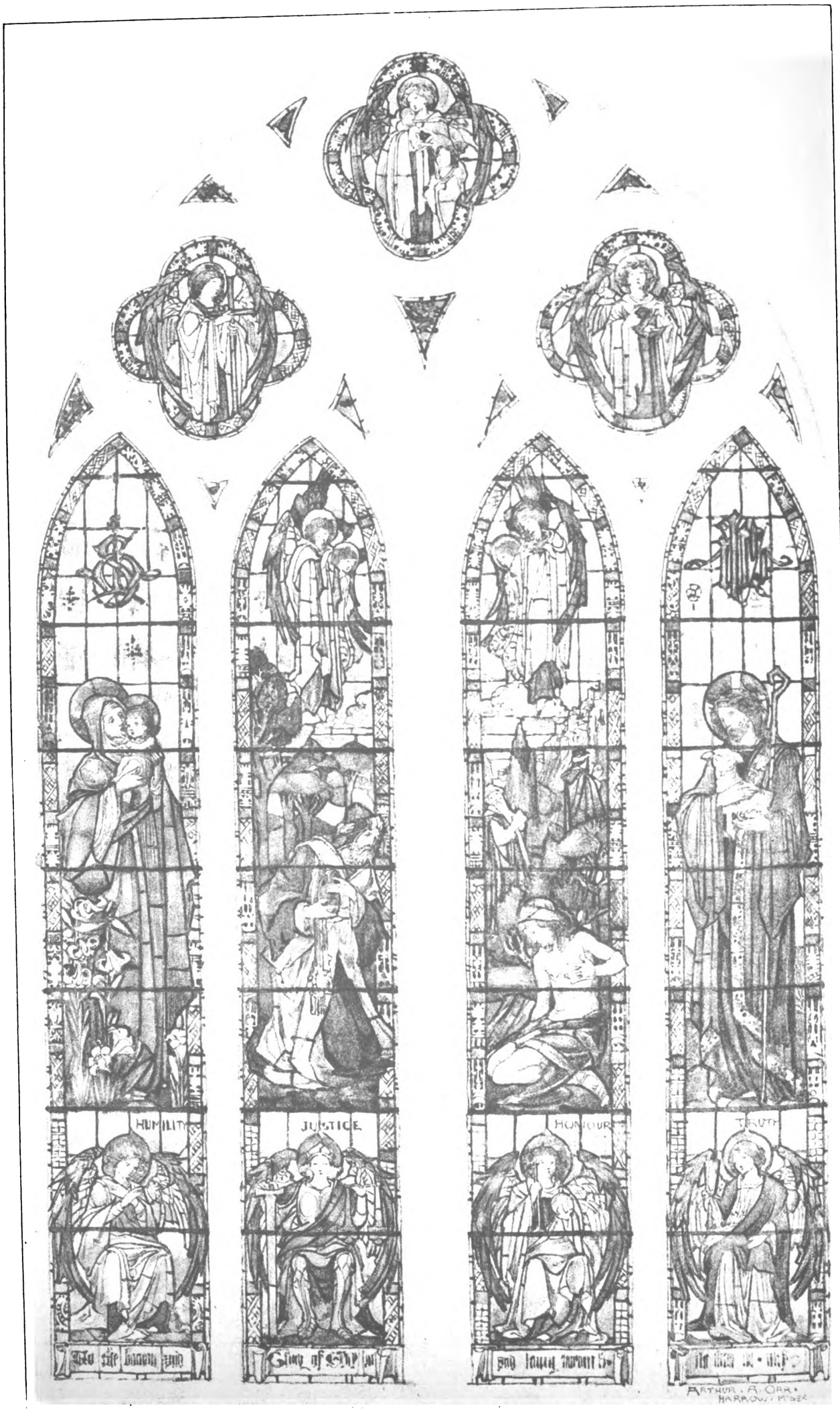
No. 1a Upper Wimpole Street, W.

Mr. W. Henry White, F.R.I.B.A., Architect.

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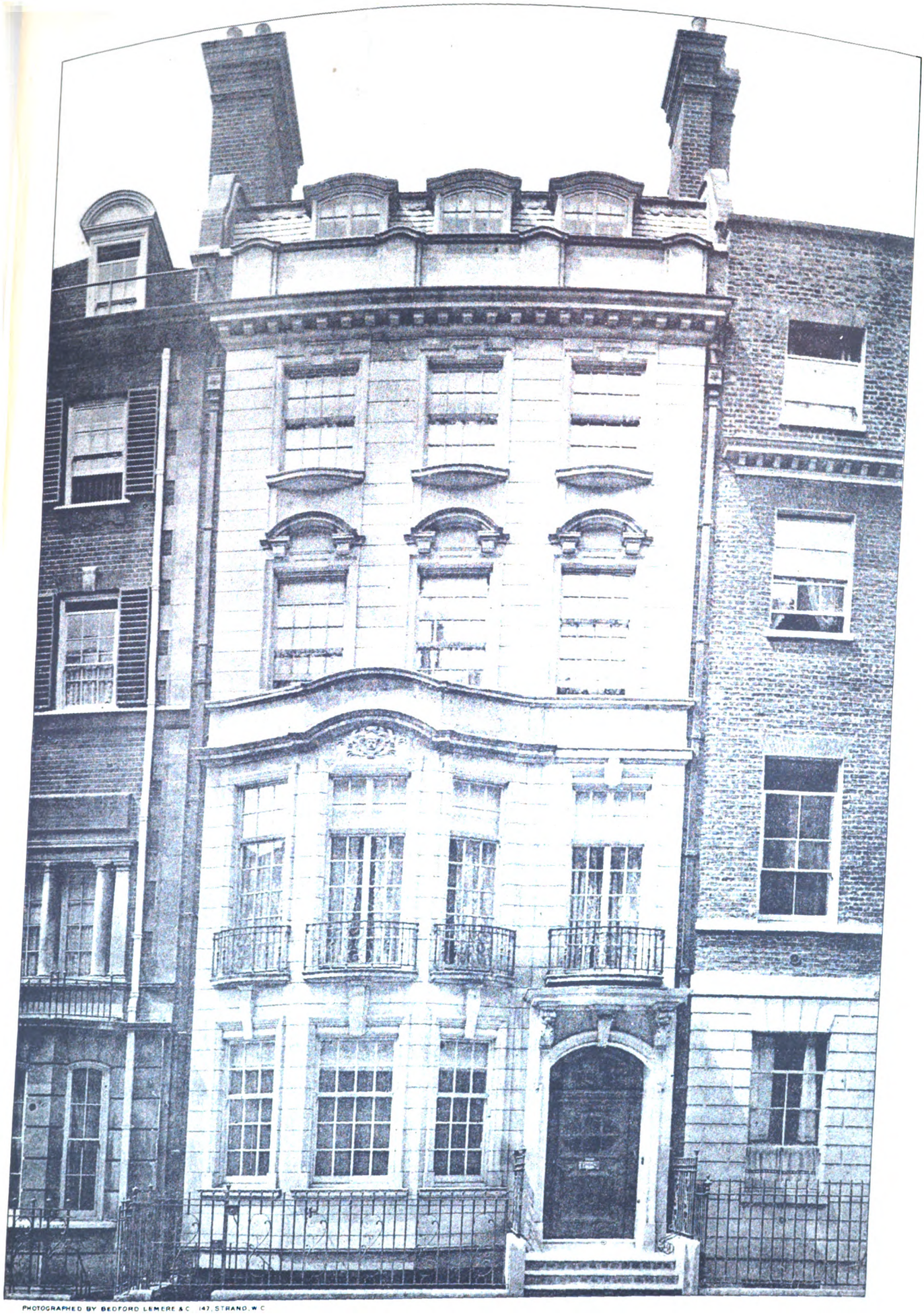
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No. 41 HARLEY STREET, W.

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CLOCK CASE IN CHESTNUT-WOOD.

By Mr. MARK ROGERS.

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MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

XIV.—LARGE COLD STORES.

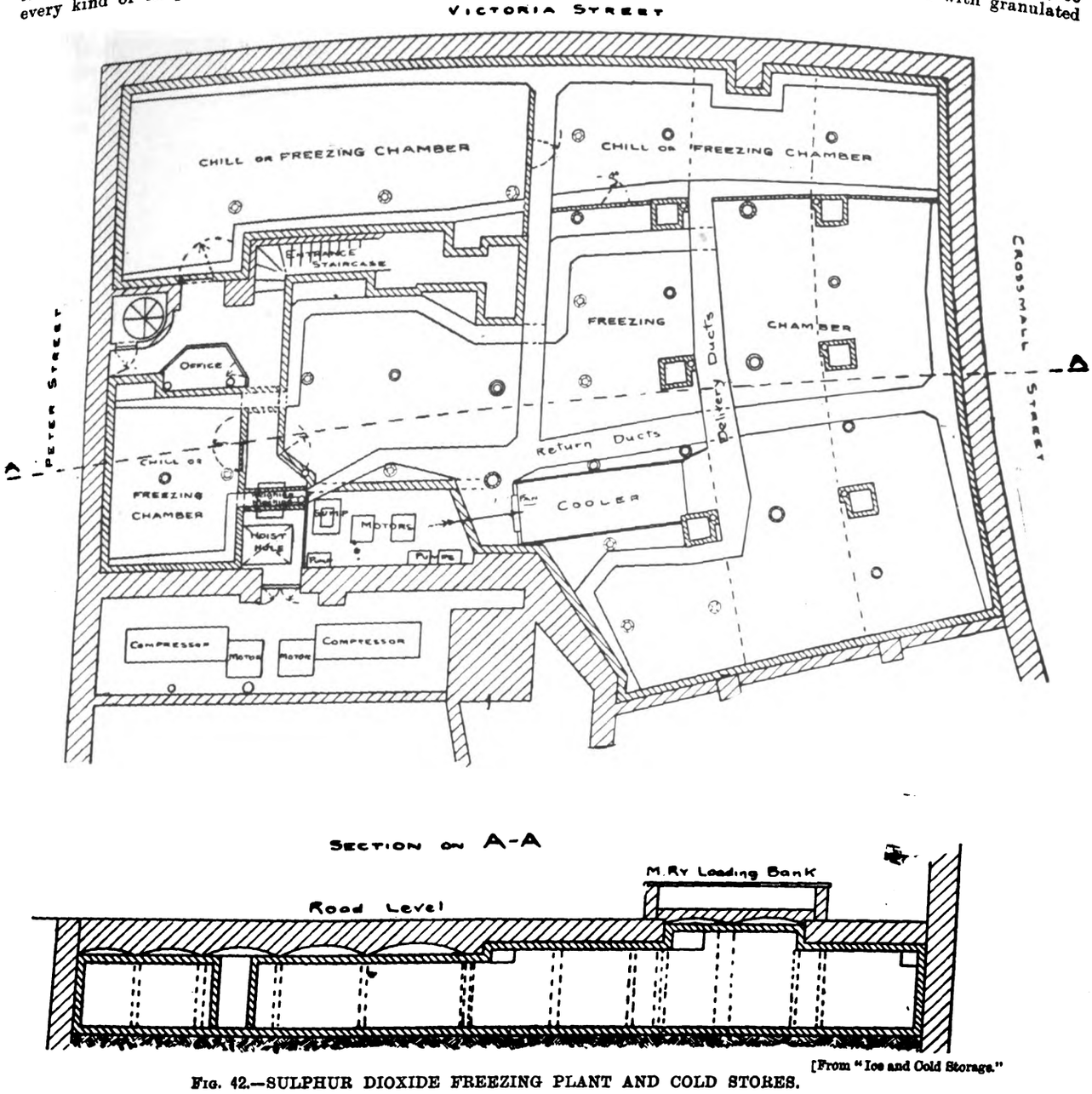
ANOTHER cold-storage plant, much about the same size as that described in the last article, is illustrated in fig. 42. The installation is owned by the Imperial Food Supplies, and is located in the basement of the Midland Railway Company's warehouse at Liverpool. It is used for the storage of meat and all sorts of perishable foods, and to enable the plant to deal with every species of provisions and every kind of temperature, four different cold rooms have been built. One of these can be used either as a freezing or as a chill room by suitable regulation; two are chill rooms, and the fourth is for freezing alone.

It will be noticed that since the rooms had to be shaped to suit the existing vaults all idea of an ideal insulated cube had to be foregone. The machinery, however, has a separate apartment, between which and the cold rooms there is a thick brick wall, and this, at least, is a step in the right direction. The other parts of the plant, too, are well designed, and, as far as the limits of the location permit, it is on the whole of a most practical nature.

The general scheme will be seen at a glance by reference to the figure. In one corner are the two compressors, direct driven by motors, and outside the building (not shown in the drawing) are the corresponding atmospheric condensers. The four cold rooms have been formed by insulating inside the walls of the vault and adapting the divisions to suit both existing arrangements and the requirements of the trade. In the middle is a large air-cooler, consisting of a separate chamber 21 feet by 7 feet by 8 feet high, connected to each of the various rooms by delivery and suction ducts, to which suitable slides have been fitted in order to insure proper regulation. There is also a small room allotted to the various pumps and their driving motors, and communication with the loading stage and the outside is effected by a stairway for passengers and a hoist for goods.

Turning to the individual details, the cold rooms, 45,000 cubic feet in total capacity, are insulated with granulated cork, 9 inches in thickness. On the floors it has been laid on the asphalte foundation between 9-inch battens and sheeted in with 2-inch T. and G. flooring, while on the walls there is first a 1-inch air space, then two layers of ¾-inch T. and G. boarding, with waterproof insulation paper between, and finally the 9 inches of cork sheeted in with 1-inch T. and G. boards, which are painted with three coats of white paint and finished with hard enamel. No air space has been provided on the ceilings, but otherwise the insulation there is the same as that applied to the walls. The interior height, owing to the irregularities of the vaults, is a variable quantity, but on the average is in the neighbourhood of 9 feet.

The gas used in the refrigerating machines, which are by Messrs. Borsig & Co., is sulphur dioxide. Electric motors,



[From "Ice and Cold Storage."

FIG. 42.—SULPHUR DIOXIDE FREEZING PLANT AND COLD STORES.

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running normally at 490 r.p.m., drive the two compressors by belts, and to meet varying loads special speed regulators have been fixed in the electrical circuit to drive the motors at anything from 250 to 600 r.p.m. The compressors themselves, each capable of producing fifteen tons refrigeration in twenty-four hours, have the advantages peculiar to the use of sulphur dioxide—that is to say, they are self-lubricating as far as the pistons and cylinders are concerned, and deliver the gas to the condensers at the extremely low pressure of 40 lbs. per square inch. The system is accordingly perfectly safe and singularly free from leaks. It is also simplified by the elimination of the oil separator.

Lap-welded tubing of 1½ inch internal diameter is used to form the two condensers, each of which is 12 feet long by 11 feet 6 inches in height, and water, taken from the mains as required, is circulated over the tiers of piping by one of the centrifugal pumps shown. The remaining unit of the system—the evaporator—is formed by the two air-coolers, which are contained in separate compartments of the air-cooling chamber. Both are made up from coils of 1½-inch lap-welded tubing, arranged in stacks and connected direct to the suction of the compressors, and either may be used without the other. The cooling, since low temperatures are necessary, is on the wet system, and consequently two centrifugal pumps have been provided, one for each cooler, by means of which the brine is sucked from the collecting tank (12 inches deep) beneath the coils and hoisted to the top for re-distribution. Air is passed through the apparatus by a 48-inch Blackman fan capable of delivering some 17,500 cubic feet of air per minute, and the distribution and collection to and from the rooms are effected by suitable trunking.

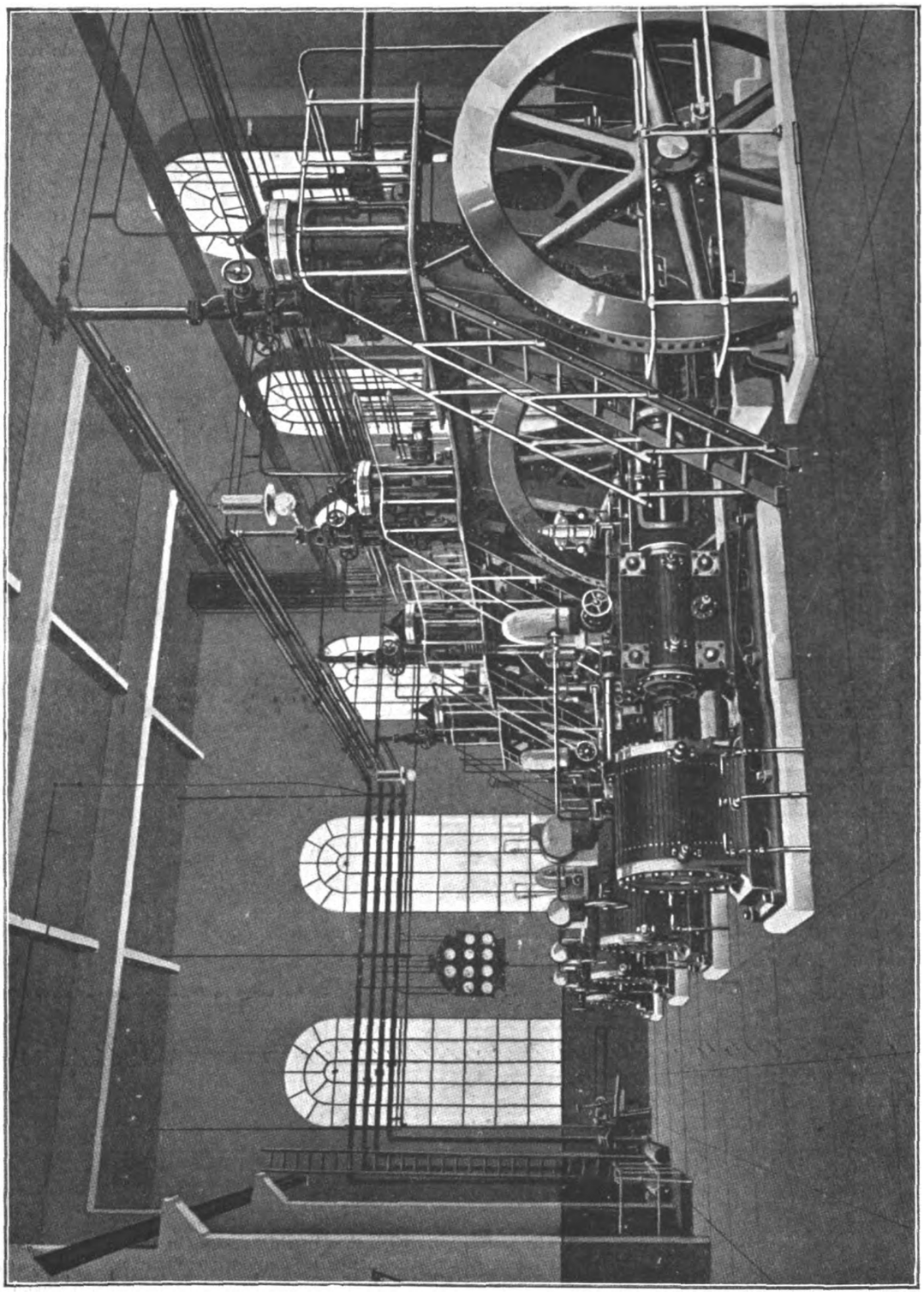


Fig. 43.—STEAM-DRIVEN COMPRESSORS AT SOUTHAMPTON

The ducts as usual are tapered as they recede from the cooler, the actual area being 10 square feet near the cooler and 2 square feet at the most distant point.

To lower the goods from the receiving house above the vaults an hydraulic lift has been fitted, capable of taking a load of 30 cwt. It delivers at its lower end into an air lock, from which the various cold rooms open, and close beside it is an "Avery" platform weighing machine. This, needless to say, is a most essential part of any large stores, as by

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its agency all goods entering and leaving can be carefully checked. Another important point is the lighting, which must be efficient and well distributed. In this case it is supplied by forty-five 16 c.p. electric glow lamps.

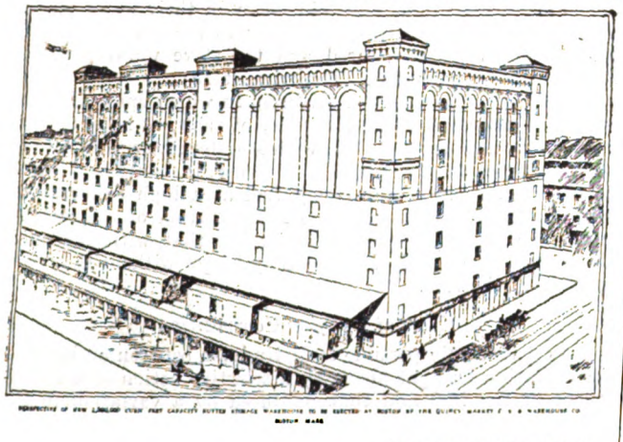
So much for the actual arrangement of the plant. As far as its general design is concerned, very little pertinent criticism can be offered. The arrangement could, of course, have been very much improved had the builders been unfettered by any limitations; but the fact of the building being already in existence was a great drawback to correct design, and under the circumstances the plant is as well arranged as it could be. The insulation is very efficient, and, indeed, had economy in outlay been a consideration, might have been reduced, but otherwise everything is laid down so as to give the maximum return for the minimum expenditure.

Many changes would, of course, take place if the same plant were to be erected in a building specially constructed. Then two storeys could be used, and two cold rooms might be placed in each. The rooms would also be made square, and the air-cooler would be so situated that each room was readily accessible with the minimum amount of trunking. At present, as will be obvious by reference to the illustration, the scheme of trunking is most elaborate and costly. There are so many bends and such a length of ducts that the expense of construction must have been excessive to a degree. But under the circumstances it was the only method open of reaching all the rooms conveniently, and consequently had to be carried out, regardless of expenditure.

The two stores, which we have just described, are, although large compared with the thousands of small plants which are running, actually quite small beside some of the huge warehouses that have been erected. Such plants are found more frequently in America than here, but one or two in this country come very near to the front rank. The biggest we have is that owned by the International Cold Storage and Lairage Company, Ltd., Southampton, which has a total net storage earning capacity of 2,262,000 feet, and will hold 5,000 quarters of beef and 160,000 carcases of mutton, leaving over 1,450,000 cubic feet for miscellaneous goods, such as butter, fish, game, poultry, eggs, fruit, &c. This large capacity is distributed over fifty-six rooms, which are contained in a building of Hennebique ferro-concrete, and cooled by the direct expansion of ammonia, applied to one floor by air circulation from a separate chamber and to three others by piping in the rooms themselves. The remaining storey (at the top of the building) is used for receiving and sorting.

The four compressors are of the vertical type by Messrs. L. S. Sterne & Co., and are driven direct by horizontal steam engines. Each is capable of producing 60 tons refrigeration in twenty-four hours, and all four, as illustrated in fig. 43, are contained in one well-designed apartment in which are also located the electric generating sets for lighting the building and driving small motors.

Perhaps the two next largest stores are the Canadian Produce warehouses, each of which has a storage capacity of 1,000,000 cubic feet. Both of these are situated at the Surrey



[From "Ice Refrigeration."

Fig. 44.—EXTERNAL VIEW OF BUTTER COLD STORES.

Commercial Docks, and can be used for obtaining any temperature from 15° Fahr. up to 55° Fahr., as required. There are also other large stores which might be described, but, as none present special points of interest, we conclude by illustrating in fig. 44 an exterior view of a large American store, erected for the Quincey Market Cold Storage Company, Boston, U.S.A. The rooms have a capacity of 1,500,000 cubic feet gross, and form an addition to their main warehouse, which has a net capacity of 2,000,000 cubic feet.

Instruments Used in Cold Storage.

Since the whole success of cold storage depends on a maintenance of the correct temperature, it is clear that the most important instrument we shall use is an accurate thermometer. There are many types of these on the market, but perhaps the most useful is the kind known as "right angle." These instruments are made in the shape of an "L," the vertical arm of which carries the scale of degrees, the horizontal arm being allowed to project through the insulation into the cold room. The construction is such that the mercury bulb is inside the refrigerated space, while the scale rests vertically against the wall of the room on the outside, and in this way it is possible correctly to read the temperature without any wasteful opening of doors.

Even with this system, however, it is quite obvious that, in the case of a store having some fifty or sixty rooms, it would take a fairly intelligent engineer all his time to run round the various apartments, to find their temperatures; more especially as regulation is always done from the engine room. Consequently instruments have been devised by means of which the temperature of every room in the place may easily be read from close beside the machines. The engineer then has his regulating valves for each system, his pressure gauges, and his temperatures all at close range.

One of the best of these is made by the Cambridge Scientific Instrument Company, and the method of application will be understood by reference to fig. 45, which shows a system

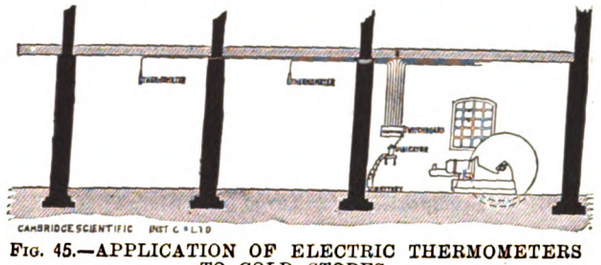


Fig. 45.—APPLICATION OF ELECTRIC THERMOMETERS TO COLD STORES.

for two rooms. The thermometers, which are suspended from the ceiling in each of the cold chambers, are of the platinum resistance type. That is to say, they consist of coils of fine platinum wire contained in a brass tube, through which an electric current is forced by the voltage due to a small battery. As the electrical resistance of the coils varies with the temperature according to a definite law, it follows that if we can ascertain the resistance value, we shall know the temperature of the bulb. Consequently what actually happens is that the resistance of the platinum is measured by a delicate electrical device known as the "Wheatstone Bridge," and is recorded on a suitable indicator. Instead, however, of reading on this indicator the resistance in "ohms," we are enabled, by suitable graduation, to read off the temperature directly, as in an ordinary thermometer, in Fahrenheit, or other degrees.

All the circuits from the different rooms are brought to a common switchboard (as in fig. 46) connected to the battery

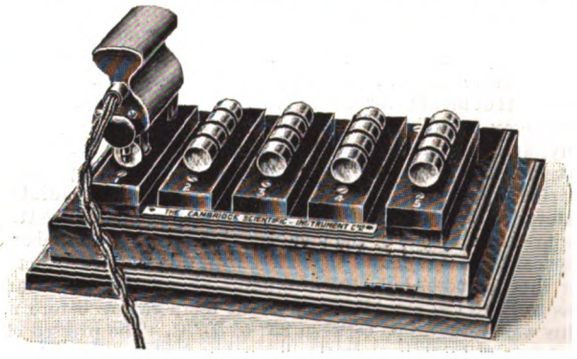


Fig. 46.—MULTIPLE SWITCH FOR ELECTRIC THERMOMETERS.

and the indicator and, by inserting a plug in the correct aperture, the temperature of any particular chamber is indicated at once. In this way it is obvious that a great deal of useless labour is saved and that since all the indicators are immediately under the eye of the engineer, any risk of accident due to over-opening of an expansion valve is eliminated. To facilitate working each expansion valve should of course bear the number of the room or cooler to which it belongs,

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and the same number should be fixed on the corresponding aperture in the switchboard.

There are also other thermometers, less expensive, which work on different principles, among which may be mentioned those utilising the thermopile, and those which depend on the vapour tension of carbon dioxide.

Another important instrument is the hygrometer, which is used to determine the humidity of the air. The most common form in which it is found is that known as the "wet and dry bulb" type, which consists of two ordinary thermometers placed side by side. The bulb of one of these is covered with a piece of muslin dipping into water, while the other is left dry. What happens when the arrangement is exposed to the air is that the water on the muslin round the wet bulb commences to evaporate and consequently to cool the bulb, thus reducing the reading of that thermometer. It follows that the dry thermometer has always the higher reading of the two, the difference being a measure of the humidity of the air. The higher it is the less the humidity. Exact tables have been published from experimental observations, and from these the humidity can always be determined to a nicety.

Other forms of the same instrument are found, such as Dynes's and the "chemical" type, but none is so practical as the wet and dry bulb variety.

The only other instrument used in cold stores is the hydrometer, by which the density of the brine is tested. This is usually supplied as a floating apparatus, consisting of a bulb and scale. According to the amount by which the scale sinks into the liquid the density is registered, either on the Beaumé or Twaddell scales. Sometimes a salinometer is employed instead, but this is simply the same instrument with a different scale.

All these instruments are supplied by refrigerating engineers, and with them instructions for use are usually sent out. Tables of conversion from one scale to another can also be readily obtained.

Specifications for Large Cold Stores.

The drawing up of specifications for refrigerating work is that part of the subject which is doubtless of the greatest interest to the architect. For if he has a knowledge of the principles of the science and knows how to apply them in practice, it stands to reason that he will be able to save his client in some cases quite a deal of unnecessary expenditure. At the same time it should be remembered that although no loopholes should be left where they can be avoided, it is unwise to hamper initiative on the part of the tenderers. Very often they have ideas and special systems which would be of material benefit to the purchaser, but which they would be debarred from introducing by too stringent conditions. In this respect refrigerating machinery is quite different from any other type of plant, as the ways in which it can be applied are so many and so various.

In the next article an idea will be given of what it is usually considered necessary to specify.

GAS HEATING RESEARCH.*

(Continued from last week.)

DURING the course of the work in connection with the Gas Heating Research Committee, it was decided that some preliminary investigation should be made into this subject. Two gas-stove manufacturers very generously lent the committee sets of moulds for making their types of fuel. A supply of fire-clay was obtained from the Farnley Fire-Clay Company, and in a short time it was found possible, with care, to make the fuels of uniform shape and weight and perfectly satisfactory for testing for their relative values as radiating materials. Some difficulty was at first experienced in getting the pressed clay out of the moulds. After trying a number of lubricants, it was found that most thin oils were satisfactory for this purpose, but that the point of greatest importance was to have the moulds at the right temperature before use. This was found to be between 25° to 30° C. The pressed clay fuels were dried in air, the holes knocked out, and heated in a muffle furnace at about 950° C.

All the fuels made were strong and durable. The first experiment had for its object the determination of the effect of varying porosities of fire-clay on the radiant efficiency of the fire-clay. The porosity of the fuel is regulated by the amount and grade of sawdust introduced into the fire-clay before it is moulded into fuel. Sometimes the sawdust is mixed with the clay while the clay is dry, but more often it is mechanically mixed (and sometimes hammered by hand by means of wooden mallets) with the clay after it is wet and ready for making up into fuels. Where convenient, it is better to mix the sawdust with the dry clay, as a better and more homogeneous material is obtained and a more uniformly porous material produced. There seems to be no fixed standard of porosity in many of the fuel works, a "few shovelfuls" of sawdust being mixed with almost any quantity of clay.

Two sets of fuels were made having varying porosities. The sawdust used was white pine, over 90 per cent. of which would go through a ⅛-inch sieve. In the first set, about 5 per cent. by weight of sawdust was introduced into the clay, and in the second set of fuels about 12 per cent. It is impossible to give the exact weights, and it is unnecessary, as the fire-clay was not perfectly dry, nor was the sawdust. But the 5 and 12 per cent. are relatively correct.

Both determinations of the radiant heat efficiency were done under the same conditions (see Experiments 14 and 15 in Table 1). From these figures it will be seen that with 5 per cent. of sawdust the radiant efficiency of the fuel was 44.7 per cent., while with more sawdust, and consequent greater porosity, the radiant efficiency was only 42.8 per cent. This would lead one to suppose that for this clay there is a maximum porosity which is useful as an aid to radiation. The value of a degree of porosity in the fire-clay lies in the fact that the porous clay requires less heat to get it to the same temperature than the less porous clay. The porous fuel also has a rough surface which appears to take up the heat from the flames better than a smooth surface.

It will be seen that the stove usually gave about 40 per cent. (Experiment No. 3) radiant efficiency with the fire-clay sent by the makers. In this experiment, the gas consumption was slightly less than in Experiment No. 14. It might have been 1 per cent. higher had its gas consumption been the same.

Half-fuels.

Comment has frequently been made that the front portion of the columns of fuel obstruct the radiations from the back portion. This is obviously the case; but there are compensations. The outer surface of the fuel is not as hot as the inner surface, so that the inner surface of the back of the fuel must be radiating more than the outer surface of the front of the fuel. But the inner surface of the front of the fuel is itself at a very high temperature and radiating towards the back of the fuel, raising not only the temperature of the fuel but the temperature of the flame itself and causing them to radiate to a still higher degree.

Arising out of such comments it was decided to make a set of half-fuels and test the radiant efficiency of the stove with them in exactly the same position as they would occupy had the complete fuel been used instead. It will be seen from Experiment 13A, Table 1, that instead of the radiant efficiency being increased by the removal of the front of the fuel, it is actually slightly decreased. Another experiment was made with the half-fuels slightly rearranged so as to catch the flames better than they did when in their usual place. This increased the radiant efficiency to the figure obtained when whole fuels were used and the stove working under normal conditions—40.57 (Experiment 13).

This is most certainly a direction in which much advance might be made, as with one surface of fuels, as is partly got when half-fuels are used, and with a hotter flame such as that obtained from the coneless Mèker burner, it should be possible to obtain a surface of fire-clay fuel at a high temperature without the obstruction of the front portion of the present columnar fuel. These experiments show that, without special adaptation, an equal efficiency may be got without the front portion of the fuel.

Fuels of Varying Composition.

As it is hardly possible to distinguish between an increase in radiation brought about by a selective action of a constituent of the fuel and that produced by a variation in the colour, no attempt was made to do so, and the results obtained by varying the constituents of the fuels may have been effected by one or both of these causes. The Farnley fire-clay was used as a basis for all the fuels made up of special mixtures. The following is an analysis of Farnley fire-clay:—

	Per Cent.
Loss on ignition	10.0
Silica	60.0-62.0
Alumina	25.0-27.0
Ferric oxide (Fe_2O_3)	1.5
Lime	.2-.3
Magnesia	.2-.3
Alkali (K_2O)	.3-.6

The fire-clay was previously mixed with 5 per cent. of sawdust, as already described.

* Abstract from second report of the "Gas Heating Research Committee" appointed by the Institution of Gas Engineers in conjunction with the University of Leeds.

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The first mixture made was—

	Per Cent.
Fire-clay	71.25
Sawdust	3.75 } approximately
Fe_2O_3	25.0

The result of this experiment can be seen in Experiment No. 16, Table 1. This was made with the same stove as Experiment No. 8. This shows a distinct increase of 3 per cent. on the radiating efficiency of the stove. Other proportions of Fe_2O_3 were not tried in this way; but this point will be referred to later.

In order that a wide range of fuels of differing composition might be tested in a shorter time, the process of making the mixture of fire-clay and other chemical constituents up into a full set of fuels for testing in the stove was dropped and a shorter and quicker method employed. For this purpose a small stove was moulded out of fire-clay large enough to take one piece of fuel. This was dried and baked at 1,000° C. A special burner was constructed for the stove and placed in position. The stove was mounted on a bench in a fixed position and a thermopile placed directly in front of it at 18 inches distance. This was also fixed. The space between was covered in to protect the stove from draughts.

When a large series of fuels had been made of varying composition they were quickly placed in position, one after the other, and at the end of a quarter of an hour the number of millivolts shown on the galvanometer read off. By this means—the gas consumption and all other conditions being kept rigidly constant—the relative radiating value of each piece of fuel could be quickly determined, and should one piece prove very much better than the rest a set could be made, and a full test made for the radiation efficiency of the stove containing that type of fuel.

There were two methods of making the experimental types of fuel.

1. In the first, the necessary ingredients were mixed together before moulding and baking the fuels.

2. In the second, a piece of fuel, as supplied by the maker, was dipped in a solution of the salt of the metal the oxide of which it was desired to deposit on the surface of the fuel. After being dipped, the fuel was allowed to dry in air, and then baked for a few minutes at 950° C. in a muffle.

Under the first head, fuels of the following composition were made up:—

	Per Cent.
(1.) Farnley fire-clay	70
Iron oxide (Fe_2O_3)	20
Sawdust	10
(2.) Farnley fire-clay	85
Iron oxide (Fe_2O_3)	10
Sawdust	5
(3.) Farnley fire-clay	87
Iron oxide (Fe_2O_3)	9
Sawdust	4

From each of these mixtures strong fuels were made; the greater the percentage of fire-clay present the easier they were to make.

No. 1 was a dark red fuel; Nos. 2 and 3 being lighter, the colour depending on the amount of Fe_2O_3 present.

	Per Cent.
(4.) Farnley fire-clay	81.4
Magnesia	14.2
Sawdust	4.4

This gave a white fuel, light in weight.

	Per Cent.
(5.) Farnley fire-clay	93
Ammonium chromate	2
Sawdust	5

This mixture had to be dried more carefully, in order that the ammonia might be driven off without breaking the fuel. The fuel obtained was a sage green colour.

	Per Cent.
(6.) Farnley fire-clay	79.8
Iron oxide (Fe_2O_3)	14.0
Ammonium chromate	2.0
Sawdust	4.2

This mixture was made for the purpose of testing whether the presence of two metallic oxides would tend to bring about a selective radiation. The colour of the fuel was a reddish brown.

	Per Cent.
(7.) Farnley fire-clay	71.0
Manganese dioxide	25.0
Sawdust	4.0

When baked this fuel was the dark brown colour of the manganous oxide.

	Per Cent.
(8.) Farnley fire-clay	70.0
Manganese dioxide (MnO_2)	24.0
Ammonium chromate	2.0
Sawdust	4.0
(9.) Farnley fire-clay	86.0
Kieselguhr	10.0
Sawdust	4.0

This mixture gave a fuel of brown appearance. It was difficult to make with this amount of Kieselguhr present.

	Per Cent.
(10.) Farnley fire-clay	81.4
Alumina (Al_2O_3)	14.2
Sawdust	4.4

The fuel from this mixture was white and light in weight.

Under the second method, the fuels were treated in the following way:—Four ounces of the nitrate of the metal were dissolved in 400 c.c. of water, and the white fire-clay fuel put into the solution and allowed to remain until thoroughly impregnated with it. The fuel was then lifted out, drained, and slowly dried, after which it was gradually raised to a temperature of 950° C.; the nitrogen oxides being driven off much below that temperature, the oxide of the metal remaining.

Fuels were dipped in solutions of the nitrate of the following metals:—

(11.) Cobalt giving a black fuel.

(12.) Nickel giving a dirty brown fuel.

(13.) Copper giving a black fuel.

(14.) Half fuels were also tested in this way, and the results showed that the amount of radiation given out from this type of fuel equalled that from the whole fuel.

(15 and 16.) The alumina and magnesia (10 and 4) mixtures were dipped in cobalt nitrate solution, and subsequently tested in the usual way.

(17.) A mixture of fire-clay, sawdust, and asbestos was also made into fuel and tested.

Fuels were also dipped in a solution of ammonium chromate of the same strength. The results obtained in millivolts as described above are as follows. The first figures are for a piece of fuel as sent out by the manufacturer.

Experiment	Method.	Millivolts.
0	1	6·1
1	1	6·6
2	1	6·3
3	1	6·2
4	1	6·1
5	1	6·7
6	1	6·3
7	1	6·4
8	1	6·3
9	1	6·2
10	1	6·3
11	2	6·3
12	2	6·0
13	2	6·8
14	—	6·1
15	1-2	6·4
16	1-2	6·2
17	1	6·3

As a result of these experiments, immediately before drawing up this report full sets of fuels as supplied by the manufacturer were dipped in (1) copper nitrate solution, (2) ammonium chromate solution, and full stove tests made with them. The result of these is that where the fuels were dipped in copper nitrate solution—giving a deposit of copper oxide after baking—the radiant efficiency proved to be 48.5 per cent. (Experiment No. 18 in Table 1); and where the fuels had been dipped in ammonium chromate solution, the radiant efficiency was found to be 44.02 per cent. (Experiment No. 17). These figures clearly indicate that with simple treatment the radiant efficiency of the stove can be increased to an appreciable extent.

The oxides deposited on the fuel were found not only on the surface, but before drying, evenly distributed through the fuel. While drying the solution concentrated near the surface, when the fuel would be the driest. The oxides were found to a visible depth in the fire-clay. After extended use in the stoves, no wearing effect could be traced on the fuels. The change in appearance due to the use of a dark coloured fuel may militate against such a treatment of the fuel. That is for others to judge.

(To be concluded.)

FAN VAULTS.*

THE paper which I have been asked to read to you to-night is on a rather technical subject, for it is useless to try to give an account of any kind of vaulting without going pretty thoroughly into the question of construction. I believe that the reason why fan vaults are given such a bad character in books on architecture is simply because very few people have troubled to find out how they are built. Perhaps you will forgive me for troubling you with constructional details, instead of giving you interesting particulars about the men who built the vaults, and how much beer was given them to make them well willed.

I want to give you a brief account of the origin and experimental stages of the fan vault in the abbey churches of

* A paper read on July 25 before the Royal Archæological Institute by Mr. F. E. Howard.

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MODERN EUROPEAN ARCHITECTURE.
AUSTRIA.



[From *Der Architekt.*

DESIGN FOR GIRLS' SCHOOL AT LINZ.—Herr J. Schulte, Architect.

Tewkesbury and Gloucester. Then I shall take pre-Reformation work in order of complexity of design, and I shall conclude with the late Oxford vaults, in chronological order. These form a chain connecting the mediæval vaults with the work of the Gothic revival.

It may be as well to explain at once what I understand by a fan vault, for the term is often very loosely applied to any vault with ribs forming tracery patterns.

The vault of the porch of Burford Church is a typical specimen. The chief point to notice is that all the ribs are of the same curvature and make equal angles with one another. The pattern of the tracery and the shape of the generating arch are unimportant when it is a question of classification only. The circular ribs are very characteristic, but they are not always found. In the central bay of the chantry chapel of Bishop Waynflete, at Winchester, these circular ribs are entirely omitted.

There seems little doubt that the fan vault was evolved either at Gloucester or Tewkesbury. At Tewkesbury there are two small and imperfectly developed fan vaults which must be some years earlier than the cloisters at Gloucester. Unfortunately the date of these examples cannot be determined exactly by documentary evidence. If we compare the lierne vaults which were being built at Tewkesbury in the first quarter of the fourteenth century with the lierne vaults of the transepts at Gloucester, we find that those of the former church show more indications of the coming of the fan vault, but in neither is there any vault to bridge the gap which exists between the lierne vault and the fan vault.

The vault of the nave of Tewkesbury abbey church was built in the second quarter of the fourteenth century. It is an elaborate lierne vault with an extremely interesting series of bosses with figure sculpture. It must be one of the earliest specimens of a kind of treatment that afterwards became very popular. That is to say, the ribs are manipulated so that the general form of the vault is approximately a large barrel vault with much lower barrel vaults running into it from the clerestory windows. Consequently the springers are remarkably square in section, and quite unlike those of a fan vault, which are circular. But the ribs are very numerous and a great deal of the vault is of cut stone, instead of being mostly rubble. Indeed, the ribs do not separate until a point about half-way up the vault, and below this point the ribs are worked out of solid stone in horizontal courses.

The vault of the choir and apse is far more elaborate. The ribs are not so bold and form tracery patterns, some of the ribs being curved while others have small cusps worked on them. The diagonal ribs and one of the intermediate ribs in the apsidal bays are corbelled off with carved heads just below the separating point of the ribs, so as to get them to spring from a small capital. This may be the origin of the manner in which the ribs of a fan vault multiply as they rise. But a more important point is that the ribs, although they do not make anything like equal angles with one another are approximately of the same curvature. Thus the transverse ridge rib rises slightly from the boss against the wall to the boss of the intermediate rib, and then, from this boss to the central one. The shape of the main ribs govern the ridge ribs, instead of vice versâ.

The vault of the transept is simpler. Here again the ribs govern the ridges, but they are of different curves. The springers, however, are managed quite like those of a fan, the ribs multiplying as they rise. The intermediate ribs spring from the crowns of small arches, instead of corbels, like the choir vault.

When these vaults were building, the abbey church of Gloucester was still a heavy Norman erection, and the choir transept had no vaults. About 1337 the remodelling was commenced, beginning with the south transept. The vault is an intricate lierne without bosses. The majority of the ribs are liernes, the longitudinal ridge rib is level, and the form of the transverse ridge rib is governed by a lierne rib, parallel to the side walls. There is nothing here to suggest the invention of the fan vault.

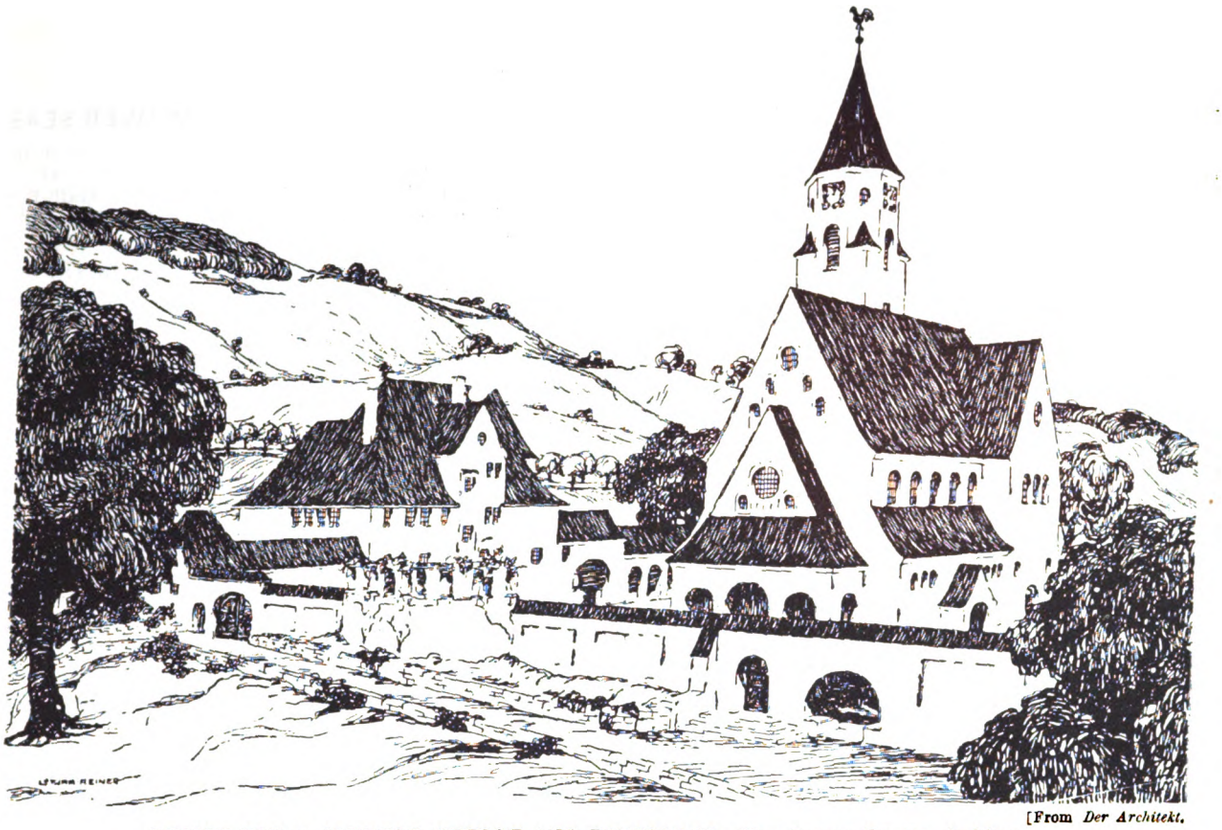
The vault of the choir was next taken in hand. The general form follows that of the vault of Tewkesbury nave, but the detail resembles the vault of the south transept, but with carved bosses.

The north transept vault starts off quite in the manner

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[From *Der Architekt.*

DESIGN FOR A COUNTRY CHURCH AND PARSONAGE.—Herr Lothar Reiner, Architect.

of a fan vault, but there is evidently no attempt to make the ribs of the same curvature. It was not finished until about 1377.

At Gloucester and Tewkesbury at the period when the fan vault first appears, the only signs of the coming of the fan vault were:—

1. A tendency to make the main ribs of about the same curvature and to let the ridge ribs take care of themselves, particularly in the choir vault of Tewkesbury.
2. A superficial resemblance between the springers of the north transept vaults of both churches to the fan vault.
3. The tendency to treat the ribs as tracery mullions.
4. The vaults are built mostly of worked stone.

Certainly the masons who built these vaults must have had the art of stone cutting at their fingers' ends, and the fan vault would be just the thing they would take delight in, but I can find no link between these lierne vaults and the vault of the Despencer monument at Tewkesbury, a decorative canopy, carved in solid stone, over the tomb on which are the effigies of Sir Hugh Despencer, who died 1349, and his wife. The vault is in form a regular fan vault in six square bays, it has no ribs, but originally tracery patterns were painted upon it. I think this form was reached through the following process:—

Imagine a square bay of vaulting, and to save trouble with centring, or in this case to make one templet serve for all the ribs, make them all of the same curve. Provide the vault with so many of these ribs that the panels are altogether suppressed and the mouldings of the ribs fuse together, and the lower side of the vault becomes a perfectly plain surface. But if the ribs are all the same length a diamond-shaped spandrel will be left in the centre; fill this in with a keystone and there you have a bay of this little vault. Each bunch of ribs has now melted together in the shape of a cone with curved sides—a conoid. The plan shows that there are two whole conoids in the middle, six half conoids around the sides, and four quarter conoids in each corner. The diamond-shaped spandrels are flat.

The next instance of the use of the fan vault appears to be the chantry chapel of Sir Edward Despencer at Tewkesbury, who died in 1375. It is a question whether this vault is earlier or later than that of the cloisters of Gloucester, but it is certainly less fully developed. Here the tracery is sunk into the surface of the vault instead of being painted upon it. But the ribs are too small to add much to the strength of the vault. The difficulty of roofing the chapel, which could not be divided into square bays, was got over by bringing the springers forward, pendant fashion. This led to an unsightly intersection of the tracery with the wall.

The east walk of the cloisters at Gloucester, from the eastern processional doorway of the nave to the chapter-house, used to be cited as the earliest of all fan vaults. Certainly it is the first instance of a true fan vault in which the tracery ribs are of sufficient size to be of real use in the construction. Three vaulting shafts are provided for the transverse and two wall ribs, then diagonal ribs spring from the arches between them, then intermediate ribs, then lesser intermediate ribs. Thus three ribs at the springing multiply until there are no less than seventeen at the top of the fan. These ribs are produced by sinking deep panels between them into the surface of the vault. This is the reason why fan vaults are called illogical and unconstructional. Let us compare the ribs of a fan vault with those of a lierne vault, such as Tewkesbury nave. The first use of the ribs of a lierne vault is to serve as centring to support the panels while they are being built. The mason starts filling in the panel from the lower end, and as soon as he has worked up to the top and the last stone is wedged in, the panel becomes an arch butting against the ridge, and supports itself. After that the only function of the ribs is to stiffen the vault and prevent it from buckling. The ribs of a fan vault do not act as temporary centring for the panels, because, owing to improvements in the methods of quarrying and transporting the stone it was possible to build the vault in large blocks, requiring very little temporary support during construction, but in all instances except a few small decorative vaults the ribs are really the main strength of the fan vault and serve exactly the same purpose as those of an ordinary lierne vault. Indeed, in large vaults we frequently find portions constructed rib and panel fashion, just like an ordinary vault. The diamond-shaped spandrel between the fans is flat, but it is not a level flag, resting on the top of the conoids. It is the keystone of the diagonal arch, although the joint does not occur at the intersection of the conoid with the ceiling. Thus the diagonal arch, although distorted, is a good enough arch, provided it has only to support its own weight, as in this case.

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Most bays of the cloisters of Gloucester Abbey are square or nearly so, but one bay of the east walk, the second from the doorway into the church, is a marked oblong. The conoids are pushed up together until they intersect, but a small flat spandrel is still left in the centre. Here the ribs are all of the same curvature but some are cut short, for the generating arch of the conoid is the diagonal, instead of the wall rib.

The north, south, and west alleys of the cloister differ only in the design of their tracery from the vault of the east walk. At the conoid at the angle of the cloister, the two patterns meet. The later work has a quatrefoil instead of a trefoil in each of the arches at the top of the fan. A panelled arch is introduced to overcome the difficulty which always occurs at the angle of a cloister—the allowance for the thickness of the wall. This trick of introducing a panelled arch or piece of barrel vault is of great service in many awkward cases, and we shall presently find other instances of its use.

The vault of Gloucester lavatory is only about half the span of the cloister vault, but the ribs are nearly the same section, and consequently project boldly. The main strength of the vault lies in the ribs, unless the panels are abnormally thick, which I do not believe to be the case.

The cloisters appear to have been completed in 1412. After this date fan vaults are met with all over the southern half of England, especially in the south-west. Many examples are small square bays in porches or chantry chapels, or under towers. I shall take a few examples in order of complexity. Beginning with the vaults with separate conoids and flat spandrels, the vault of the Stanbury chapel at Hereford, c. 1470, appears to be a copy of the vault of Gloucester cloisters, but it is an improvement in many ways. The pattern of the tracery is almost exactly the same, but the ribs are much stronger, and evidently do their work as well as those of any ribbed vault. The boldness of the ribs and the colour of the new red sandstone of which it is built, give it an altogether different feeling from the Gloucester work. Moreover, the arch is four-centred, instead of being acute.

On the south side of All Saints Church at Evesham there is a chantry chapel, built by one of the last abbots, which has another delightful fan vault of similar type but with very different tracery. Here five main ribs are allowed to spring from the corbels. The tracery is of exquisite design, but there is no carving except the square flowers in the doubly foliated quatrefoils of the central rose.

The two last vaults are in square bays, but it is possible to adapt a square fan vault to an oblong bay.

The simplest method was to eke out the square bay with a section of barrel vaulting, as in the vault of the porch of Torbryan Church, Devon. The ribs of this vault are quite unconstructional. They are wide and flat, and are cut away for carved figures of angels on the surface of each quarter conoid.

Another method was to widen out the flat spandrel, so that the conoids do not touch. This makes the vault very flat and is only possible on a small scale. The small chantry chapels on each side of the Lady chapel at Gloucester are charming examples of this solution.

Another very clumsy solution is to be seen at Cirencester. The passage beneath the magnificent south porch is fan vaulted. There are three complete square bays, leaving an oblong space. The vault over this space is not modified, but the conoids are continued until they intersect with the wall. The vault of St. Catherine's chapel, in the same church, is similar. Under towers it was necessary to leave a circular hole in the middle of the vault through which to lower and raise the bells. This is quite easily done, for the joints of the circular ribs, framing the opening, radiate from the centre, forming a horizontal arch, against which the ribs of the fan safely thrust. Fan vaulted towers are usually found in the West of England, Wrington, Axbridge and Glastonbury in Somerset, and Edington in Wiltshire are examples.

Another treatment of the central spandrel is to pull the rose in the middle into a pendant in the form of a conoid. The vault of the chantry chapel attached to St. Lawrence Church, at Evesham, is an example. On plan there is no difference between this vault and the flat spandrelled fan vault of the other Evesham chantry chapel. In perspective, however, the pendant has a beautiful effect, though it cannot be defended on constructional grounds. It is simply worked out of the stones of the flat spandrel. The pendant of the vault of Alcock's chapel at Ely is constructed of open work. A long keystone depends from the centre of the vault and little flying ribs spring from the lower part of it and abut against the circular rib. The solid pendant is the most usual form. It occurs in the aisles of Henry VII.'s chapel at Westminster.

(To be concluded.)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) devotes its principal illustrations to recent work of Messrs. Carrère & Hastings—the Globe Theatre, New York; the City Hall, Portland, Maine; the Bryant Monument at the New York Public Library; and a gentleman's house in Kentucky.

La Construction Moderne (Paris) in its series of articles on old Paris, now gives an account with sketches of the Hôtel de Lamoignon. The chief illustrations are of the new Royal Palace Hotel in the rue de Richelieu, Paris, of which M. Constant Lemaire is the architect, and which is remarkable for the way in which a wonderful amount of chiaroscuro is obtained in a straight-fronted street building.

Der Architekt (Vienna) has an article on the various schemes that have been proposed for the re-formation of the Karlsplatz at Vienna from the date of the competition in 1893 to the latest designed by Wagner in this year, which is an interesting piece of history in town-planning. The principal illustrations are devoted mainly to domestic work, which are quite charming, the exceptions being a sketch of the Krebsenkeller at Graz and the printing offices of "Vorwarts" in Vienna, of which Herren Hubert & Franz Geszner, who belong to the Wagner school, are the architects.

Il Monitore Tecnico (Milan) has rather an interesting article on the planning of the church of St. Lorenzo at Milan, based on a theory of triangulation, which *se non è vero, è ben trovato.*

Contract Record (Toronto) gives statistics of the continued remarkable increase of activity in the building trade of Canada, showing that in twenty-three cities of the Dominion there was an average increase of 41 per cent. in the value of buildings commenced in the first six months of this year as compared with the corresponding period of last year. In Saskatoon, Regina, Strathcona, and Sydney there has been an increase of 200 per cent. or more. Canada is clearly the field for young British architects to go to.

Zodtchy (St. Petersburg) illustrates the designs for recently determined competitions for a bank and for a church, which give a good idea of present-day architectural design in Russia. The first premiated design for the bank is by M. A. Lichnevsky and that for the church by M. N. Vassiljeff, and both are based on historical motifs rather than the "new-art" affected by some other competitors.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

A Further Open Letter to Sir Aston Webb, C.B., R.A., F.S.A., F.R.I.B.A.

Sir,—Adverting to my former letter, published in *The Architect* of April 1 last (Supplement, p. 16), I feel certain the further experience you have gained in connection with the competition for the Usher Hall must have emphasised the point I particularly desired to call your attention to, viz. that plans, and plans alone, were the deciding factors, and that consequently the appalling waste of time and money by competing architects could be stemmed by limiting the work in its first stage to sketch plans. The out-of-pocket expenses in the Edinburgh competition must be at least 6,500*l.*, and what good is it now? Many, if not all, competitors must agree that at any rate the design—per se—had nothing whatever to do with the decision. No wonder the general public, after seeing the lavish display of wasted money, think our profession so enticing and hasten to add to the ever-increasing number of embryo competitors, and further look on the 5 per cent. commission as too much to pay for our services when such willingness is shown by architects to throw away money on competitions with a 100 to 1 chance.—I am, &c.,

L.

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The Architect.

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THE A.A. ANNUAL EXCURSION.—II.

CONTINUING Tuesday's programme, the excursionists took train through the outskirts of Leeds to Crossgates Station and then drove to Austhorpe Hall, an interesting house bearing date over the entrance 1694 and the initials J. M. O. R. in a monogram. Externally the house is practically in its original state, except for some quite recently rebuilt chimney stacks. Built of brick, with stone quoins and window architraves, retaining its old wooden window-frames and glazing and covered with stone slates, simple in composition, with a slightly projecting centre containing the entrance doorway with window over and completed by a pediment, three sets of two-storey windows on each side of the centre, this small house of the end of the seventeenth century is a model of restrained and effective design and one well worthy of any modern student's thorough study and complete measurement. Internally the design is equally reticent: ceilings panelled with simple mouldings, oak panelling to the walls on the ground floor, and painted wood panelling on the first floor. The original main staircase has gone, but the back one has some good balusters. An especial feature of the house is the excellent character of the mouldings both in wood and stone. Of historical interest is the fact that JOHN SMEATON was born in this house and lived in it for the greater part of his life.

From Austhorpe the members, after a short visit to Whitkirk Church, drove to Temple Newsam. Whitkirk Church, although practically rebuilt about fifty years ago, has some interesting features—a fine alabaster tomb of Sir ROBERT SCARGYLL and JAHNE his wife, date 1605; a good Renaissance tomb of EDWARD INGRAM, Lord Viscount IRWIN, who died September 16, 1688; and a later memorial to CHARLES Viscount IRWIN, died 1778, and his wife FRANCES, who died 1807. There is also a recently added sanctuary by the late Mr. BODLEY.

Temple Newsam is so-called from the fact that a preceptory of Knights Templars was here founded in 1181. Of this there are no remains, the earliest work existing being what is known as the "King's Chamber," in which was born DARNLEY, son of the Earl of LENNOX and MARGARET, granddaughter of HENRY VII. This room, which contains some good plaster work, was part of the house built by the DARCYS, who held the property from the time of EDWARD II. to the execution of THOMAS, Lord DARCY, a participant in the Pilgrimage of Grace, 1569.

The existing house was built by Sir ARTHUR INGRAM in 1630, and was burnt in 1635, but apparently at once rebuilt. It forms three sides of a quadrangle, north, west and south, of which, as an inscription records, "This south wing was entirely rebuilt by FRANCES SHEPHEARD, Viscountess IRWIN, relict of CHARLES, ninth Viscount IRWIN, in the year 1796." The internal detail of this wing, evidently of French workmanship, is of a very high character, and, granting the peculiarities of the period, well worthy of study. The older portion of the house is rather bare of detail, and the external composition a simple alternation of bays and flat wall in brick with stone dressings. What external detail there was, in the form of a balustrade, has suffered and is suffering terribly from the smoke of Leeds. Stone balusters and copings have been replaced by wood or are attenuated to a mere skeleton. The stone balustrade lettering of the words "All glory and praise be given to GOD the Father, the Son, and Holy Ghost, on High; Peace upon earth, goodwill toward men; Honour and true allegiance to our Gracious KING; Loving affections among his subjects, health and plenty within this house" has been replaced in cast iron.

The late Mr. G. F. BODLEY, R.A., has carried out considerable alterations internally and a new entrance doorway on the north side, but the chief interest of the house, which is one of the privately maintained national museums of England, is the fine collection of pictures, furniture, and especially china. To enumerate these would be wearisome; RUBENS, VANDEVELDE, ALBERT DURER, GIORGIONE, REMBRANDT, CLAUDE, Sir JOSHUA REYNOLDS and other masters of various schools and dates are represented. An interesting relic is a mazer bowl said to have belonged to the Templars, whilst Dresden is particularly well represented in the collection of china.

On Wednesday the whole day was spent at York, which was reached by train. The members were met by Mr. J. H. RUTHERFORD, Pugin Student 1899, and Owen Jones Student 1901, and by him conducted through a lengthy and thorough programme which was arranged to give the excursionists as complete an insight into the many artistic treasures of York as was possible in one day. The buildings visited included the house of the Stuart kings, now used as a school for the blind; St. Mary's Abbey, the Minster, the Treasurer's House, St. William's College, Merchant Tailors' Hall, Merchant Venturers' Hall, the churches of All Saints, Pavement; Holy Trinity, St. Michael, Spurrier Gate; St. Martin, Coney Street; All Saints, North Street; Castlegate House, Queen's Hotel, the Assize Courts, Mansion House and Guildhall.

The house of the Stuart kings was at one time a palace of the abbot of St. Mary's, on the suppression of which it became the King's manor, and additions were made between 1572 and 1595, 1603 and 1619, 1628 and 1641. Though decayed and damaged, these still contain some interesting, if not very beautiful, detail.

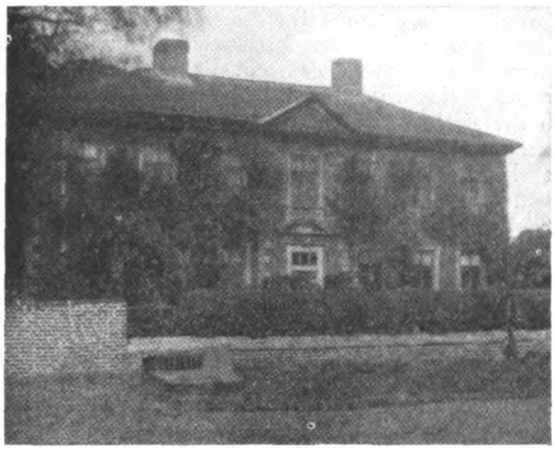
St. Mary's Abbey is now in ruins, the most important remains being those of the nave, the building of which was begun by SIMON DE WARWICK, abbot from 1259 to 1299. These remains are now included in the grounds of the Yorkshire Philosophical Society, which also contain the ruins of St. Leonard's Hospital, built by Archbishop THOMAS between 1108 and 1114, and of the Roman wall and tower of Eboracum, as well as the Museum, a well-designed Greek Doric building built in 1829.

Of the Minster we need hardly now give a description, as it has been fully illustrated in *The Architect* Cathedral Series between January 4 and June 28, 1901.

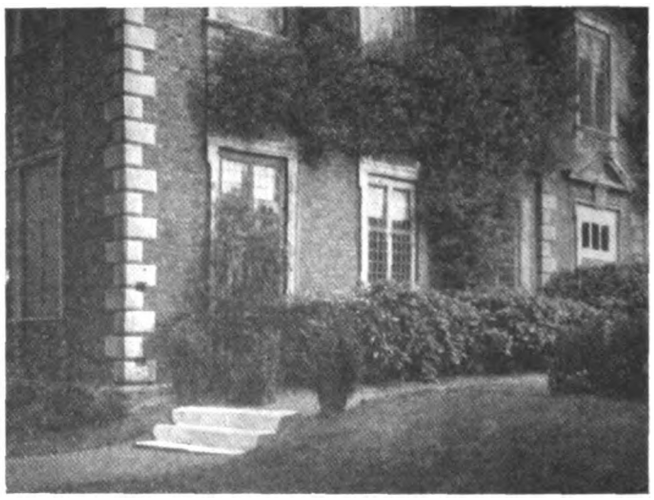
The Treasurer's House has a lengthy history as the residence of the official treasurers of the Minster from RADULPHUS, who was appointed the first treasurer in 1100, to WILLIAM CLYFFE, who in the year 1538 "resigned" his dignities, demeans, manors and advowsons to King HENRY VIII. There is clear evidence, however, that the house in which RADULPHUS lived was erected on the site of a still older building, and ancient remains have been found which it is supposed formed part of the Roman Imperial barrack that stood between Aldwark and the Minster. Of the present house the

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basement is of early date and has two thirteenth-century doorways; the banqueting hall is thought to be late fifteenth century; but another room, now removed, was put in the upper part by Sir George Young about 1620. The remains of the frieze of the banqueting hall are Jacobean, and the hall was probably then covered by panelling. The lower mullion windows on the east side are of Henry VIII.'s time, and were most probably put



AUSTHORPE HALL.



AUSTHORPE HALL

in by Archbishop Holgate. Sir George Young also possibly altered the gables and put the classical orders on the front. The Gothic gable at the back no doubt keeps the original design, as a MS. in the British Museum and other prints show all the gables pointed. The house has been restored by Mr. Temple Moore, and remains a veritable storehouse of interesting detail and picturesque treatment, with much old furniture and many old pictures.



TOMB OF SIR CHARLES WANDISFORD, KIRKLINGTON CHURCH.

St. William's College, founded in 1460 "for the parsons and chantry priests of the cathedral" by George Neville, Bishop of Exeter, and afterwards Archbishop of York, and Richard Neville, Earl of Warwick, has already been partly restored under Mr. Temple Moore, and now presents a highly picturesque front with overhanging upper storey and oriel windows in half timbering. The restoration is at the present time proceeding and the hall is being fitted for meetings of Convocation. The internal courtyard, when the restoration is completed, will be no less picturesque than the front to the street. Of particular interest are the carved oak figures that at intervals decorate the cove between the stone walls of the ground floor and the overhanging upper part.

The Merchant Tailors' Hall contains little of interest, but the hall of the Merchant Venturers contains several items of interest, part of the building, with pointed gables and bargeboards, being of fifteenth-century date, to which also belongs the chapel, whilst other parts, including the entrance from Fossgate, are of the seventeenth century.

Mr. John Bilson, F.S.A., a former regular attendant at A.A. excursions, was responsible for the visits to the churches we have mentioned, the especial object of research being the ancient glass for which the city of York is remarkable in its parish churches as well as in the cathedral. All the churches to which Mr. Bilson conducted the members contain old glass worthy of study, but pre-eminently St. Martin, Coney Street, Holy Trinity, Goodram Gate, and All Saints, North Street. In addition to the glass should be noticed a fifteenth-century lectern in All Saints, Pavement, a fine Renaissance font cover, dated 1717, in St. Martin's, Coney Street, a pulpit of 1675 in All Saints, North Street.

Castlegate House is one of the works of John Carr, and contains some excellent detail in its plaster ceilings and wall decorations, its staircase and its chimneypieces in marble and plaster. There is an undeniable refinement and grace about the design, particularly of the internal detail, that justifies Carr's reputation. The building is now used as the City Club.

The Queen's Hotel, in Micklegate, does not from the outside promise much of architectural interest, but on the first floor are some panelled rooms of exceedingly good detail and original in treatment, eighteenth century in date, which are worthy of the city that contains the work of Carr. The existence of this excellent woodwork is due to the fact that the building was formerly the town house of the Duchess of Sutherland.

The Assize Courts, designed by Carr and erected in 1777, the Mansion House, built in 1726, and the Guildhall, which dates in part from 1446, received comparatively little attention, for both the time and the energy of the excursionists was at the end of the day almost exhausted.

(To be concluded.)

NOTES AND COMMENTS.

The catastrophe that has overtaken the Brussels Exhibition is peculiarly lamentable, not only for the loss of the products of modern British manufacture and commerce, and for the ruin of much of the attractiveness of the show, but also for the irreparable loss of priceless and irreplaceable ancient monuments of the arts and crafts of past times.

The Historical Loan Collection, by which the history of furniture and decorative design in England was represented, contained a wonderful array, brought together

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from country houses of private owners and public collections, of sixteenth, seventeenth, and eighteenth-century woodwork, illustrating in four rooms Tudor furniture, Stuart furniture, William and Mary and Queen Anne furniture, and lastly, the designs of Chippendale, Sheraton, Hepplewhite, and Adam. Needlework, china, metalwork, glass were included in these four rooms, everything in which owed its position and much of its interest to its authenticity and original workmanship of artistic handicraftsmen of past days. As such they are irreplaceable, and whatever solatium the owners may receive from underwriters and insurance companies, the world is the poorer by the destruction of the work of bygone artists.

Our great furnishing firms, Gill & Reigate, White, Allom & Co., Cowtan & Sons, Waring & Gillow, also lost many genuine examples of ancient craftsmanship, though to some extent their exhibits were replicas of old work. It is fortunate that the fine display of articles lent by the Victoria and Albert Museum in illustration of British silversmith's craft were all electroplate copies of articles of which the originals are safe.

The influence of the Brussels catastrophe upon future exhibitions must necessarily be great. Private owners, with such an example before them, will be chary of lending valuable originals, the destruction of which no insurance company can remedy. Hence the example of the Victoria and Albert Museum and of trading firms must be followed. But private owners can scarcely be expected to defray the cost of producing replicas for loan, neither can an ordinary exhibition, unless heavily subsidised by a Government, incur the expense. As far as the exhibitions go and the pleasure of their visitors is concerned, replicas are all that are necessary. Serious students are always prepared, and, indeed, would prefer to see and study in museums.

Another lesson that may be learnt from the Brussels fire is the necessity for a sound fire-resisting construction of exhibition buildings, for the prevention of the outbreak of fire, and for adequate means of fighting and extinguishing the fire at its inception. Apparently, all these three desiderata were lacking at Brussels, although they are essential for the safety of person as well as of property. One naturally thinks of the present Japan-British Exhibition in London, and is glad to feel that the promoters have been strictly supervised by the officials of the London County Council, whose restrictions and regulations, if sometimes a bit irksome, are usually well directed towards fire prevention.

Speaking of fire prevention, we have noticed in an evening paper a suggestion by Mr. Ernest Runtz, F.R.I.B.A., for the prevention of the start of such fires as lately occurred at Battersea and Accrington. Mr. Runtz's suggestion is briefly that the objects displayed on the stall-boards of retail shops dealing with inflammable material should be isolated from the main area by brick-walls or fire-resisting glass in hardwood framing. Wired glass in hardwood framing has been shown, by the tests of the British Fire Prevention Committee, to have remarkable ability in resisting for a considerable and useful time the attack of fire. Mr. Runtz further advises that the stall-board enclosure should be filled with sprinklers. The suggestions appear to us good, as far as they go, but the stall-board is only a very small portion of the area of a draper's shop, and although it has happened in prominent instances that fires have originated in the window-dressing, there is no reasonable probability that this is more dangerous than any other part of the shop. Inflammable goods are everywhere, and short circuits are possible anywhere with inadequately protected electric wires.

Mr. W. D. Caroe, in a letter to the *Times*, falls foul of the first interim report of the Royal Commission appointed to make an inventory of the Ancient and Historical Monuments and Constructions in Wales and Monmouthshire for their acquiescence in the spoliation of Newport Castle and the prehistoric camp at Penmaenmawr. Certainly it is to be regretted that the Commission does not apparently see its way to recommend immediate action for the salvage of the ancient and historical monuments and constructions of which it is its function to make an inventory, but which it finds in danger of destruction. The inventory is of little value if it is not to serve as the basis of preservation, and may even become ludicrous if it records the existence of monuments which may vanish or be hopelessly spoilt before it is completed.

The action of the committee of the Kent County Council appointed to consider what steps should be taken with regard to the erection of new county offices at Maidstone, in recommending that the county architect should prepare the particulars of an open competition in which the firm of which he is a member should be allowed to compete, shows ignorance of what architects who take part in competitions consider fair play. We are glad to note that this recommendation was negatived by the Council, partly with the support of those who thought the county architect should design the required building as part of his ordinary duties. It would be far better that this should be done than that a professedly open competition should be tainted by the supposition that one of the competitors was in an unfairly privileged position.

The importance of proper provision being made in hotels for the prevention and early extinction of fire and for the escape of their inmates is illustrated by the death of five victims at the Kelvin Hotel, Belfast. This hotel appears to have been formed by the union of some private dwelling houses, and the evidence showed that the Belfast Corporation had no power to require proper planning or construction or the provision of adequate fire appliances. Hence the following recommendation of the coroner's jury, which Parliament would, in our opinion, do well to adopt and make applicable not only in Belfast but throughout the kingdom. The jury's recommendation was:—"(1) The Belfast Corporation are strongly urged to seek immediate powers from Parliament giving them authority to make by-laws to demand that all alterations to existing properties and the erection of new buildings should be carried out to their requirements, and to enable them to inspect the hotels in the city; and also to see that proper provision is made for the safety of persons. (2) We also recommend that notices be placed in prominent places in hotels showing means of exit. (3) We further recommend that additional fire alarms should be erected throughout the city."

ROYAL ARCHÆOLOGICAL INSTITUTE.

By Our Special Representative.

(*Concluded.*)

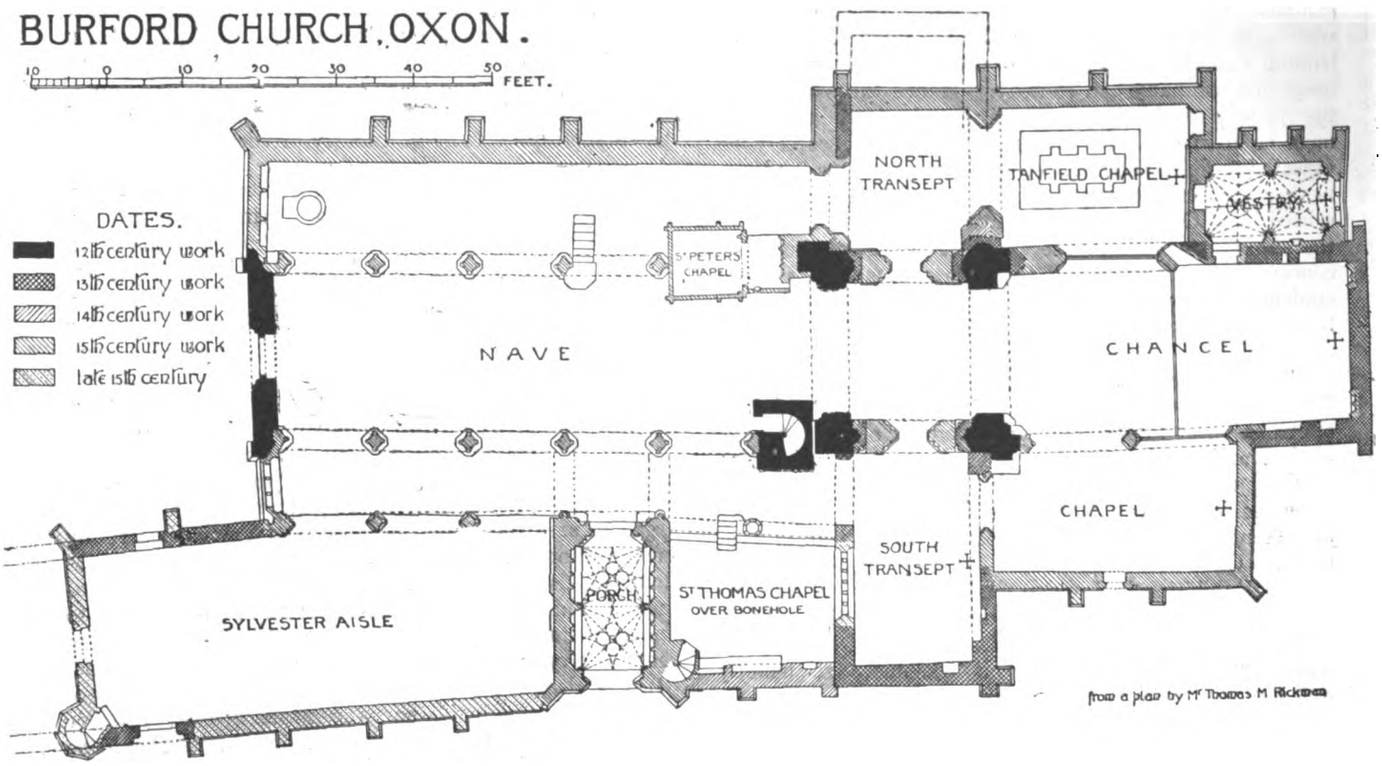
Thursday, July 28.

Witney Church.

THERE are two districts in Oxfordshire which are more especially rich in churches; one lies in the north and the other in the west. It was amongst the latter of these that the Royal Archæological Institute passed the last of their ten days' summer meeting, when three out of the four most striking churches in this locality were visited—viz. Burford, Witney, and Minster Lovell. The first on the programme was Witney. This is eleven miles due west of Oxford and was reached by train. The church lies at the south end of the spacious village green which runs the length of the broad principal street. Mr. Harold Brakspear, F.S.A., who described the building, said that it had no documentary architectural history. This is regrettable, as the church as it now stands is the product of many generations of worshippers. Like so many others in the county it still retains traces of its Norman origin. Mr. Brakspear said the twelfth-century Norman church was an aisleless one, and the remains of it survive in the holes above the first bay of the nave arcade,

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which show the position of the first clerestory windows, and the complete Norman window pierced in the last bay on the north side. The first addition to that nave was a twelfth-century north aisle with a porch; of this only the fine Transitional-Norman porch exists. It was followed by the erection of transepts on each side, with two rather handsome windows. These east windows were recessed and were carried down to the ground for the purpose of accommodating altars in the way that may be seen in a few Oxfordshire churches. Before these transepts were completed the builders broadened them westwards by the width of another bay. When visiting on the previous day the churches at Bloxham and Adderbury the party had had their attention directed to three curious carved capitals carrying arches over the aisles; in the first-named place one was in the south transept, and in the second there was one in each transept. At Witney, said Mr. Brakspear, the explanation of such a capital was to be found; it was for the purpose of carrying the western transept aisle. By the end of the thirteenth century rebuilding also included the chancel, the central piers at the crossing surmounted by the tower with its tall spire, and the erection of aisles and a north transept. In the following century this latter transept was extended further northwards by the addition of an elaborate chapel with an altar raised over the bonehole. Below its beautiful north window are two foliated niches with stone effigies. Apparently the builders thought the south



[By permission of the Royal Archæological Institute.

transept had to be made to match, so a bay was added. Later the Wenman (or Waynman) Chapel was erected on the north side of the nave and west of the Transitional-Norman porch. It is separated from the nave by a screen. The chapel is entered by an ogee door with large ball-flower ornament. In the fifteenth century the south aisle and clerestory were rebuilt. The north window of the north transept, with its flowing tracery of the lily pattern, is considered amongst the finest Decorated windows in Oxfordshire.

Minster Lovell.

The road from Witney to Minster Lovell follows the course of the Windrush for some three miles, and it presents a series of very charming views. The name of the village recalls its association with the Lovell family during four hundred years, as well as the fact that a small priory in connection with the monastery of Ivry, Norman, was founded there by Maud Lovell about 1200. The priory was dissolved by Henry V., and shortly afterwards, probably in 1430, William Lord Lovell erected the present church (or at any rate the greater part of it) and a large manor house, which now lies in ruins. Mr. Brakspear said that it had for a long time been held that the small cruciform church was all of one date; but on the south wall of the south transept and on the east walls there are fourteenth-century buttresses. The plan of the church is interesting, for though the chancel is slightly longer than the nave it is narrower. The difficulty was overcome by supporting the central tower on four detached piers. The pair to the west stand well away from the walls, the distance being sufficient to enable a procession to pass, while those to the east are partly detached, being each pierced by a large squint bearing directly on the altar. Another squint gives a view of the altar from the small fifteenth-century vestry on the north side of the chancel. In the corner of the south transept where it joins the nave there is a circular staircase leading presumably to a rood by a passage across the transept. Mr. Brakspear was inclined to think that there the screen never had a loft over it. The pews in the nave are old. In the south transept is a fine alabaster tomb variously ascribed to the founder, to his son John, and also to Francis Viscount Lovell. The difficulty of assigning it is partly due to the fact that three Lord Lovells died between 1455 and 1487. Mr. St. John Hope said the monument was of quite an unusual character in its delicacy and the general manner of decoration, as in the arrangement of hanging the heraldic shields and the provision of statuettes. The figure of the knight has round its neck a very fine gold chain and a perfect little leopard's head. The Vicar of the parish said it had been handed down to him that at the time of the restoration of the church fifty years ago the tomb was found to be broken down the middle owing to a subsidence of the ground. It was carefully repaired. He had also been told that the shields were then quite black, the present quarterings being put on more or less conjecturally and therefore could not be relied upon to show the alliances of the Lovells.

The fifteenth-century manor house affords scope for speculation, as except for the four walls of the lofty hall, with its entrance porch on the north and a chamber built up against the north wall, such portions of the buildings as have not entirely disappeared now lie in ruins. It consisted of the hall with the customary two-storeyed block at the east and west ends, and at the latter end a small court with buildings, including a Perpendicular tower, running down to the Windrush. About 1730 the house was dismantled and unroofed. Apparently such materials as were of value were sold, for it is recorded that in the roof of the rectory house at Ducklington (near Witney) which was erected about this time there are some fine oak beams showing the royal arms and the arms of one of the Lovell alliances.

Burford Church.

The last visit on the programme was to Burford, and it made a worthy conclusion to an industrious ten days. The

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streets of the town are richly sown with interesting fronts, and in addition there is the priory, and above all the church. It is curious to be told that this church was originally of the same type as Iffley; for whereas the latter (except for the lengthening of the chancel by one bay) is in plan unchanged since its erection in the twelfth century, Burford church has developed in the most curious way. All the remaining Norman work is in the central tower and the west wall of the nave. In the thirteenth century a new chancel was built; it was followed by transepts with spacious eastern chapels and the narrow south aisle. About the same time a detached chapel was built in the churchyard to the south-west; but this chapel was eventually joined up to the south aisle, and is called the Sylvester aisle. In the fourteenth century the St. Thomas Chapel was built over a bonehole against the west side of the south transept. In the next century a considerable amount of rebuilding took place; a north vestry was added, the tower raised, and a spire built. The latter work was, it is said, done by Christopher Kempster, clerk of works to Wren, whose memorial tablet is in the south transept. The inscription records that "he was a Freeman of the City of London. He was a person eminent in his profession, and built several churches in the said city, and was many years employed in building the cathedral and dome of St. Paul's. He chose this parish in which he was born for a place of retreat from business in his later years, which he employed with the greatest care and study to fit and prepare himself for a blessed eternity. He died August 12, 1715, in his eighty-ninth year."

There are, it will be observed, five distinct chapels, exclusive of the altars in the transepts. The most curious is the St. Peter's Chapel, which is a little enclosed space under the first bay between the nave and the north aisle. This was erected as a pew for the use of the priory, and has again been devoted to that purpose. The eastern portion consists of a stone canopy built against the central tower pier with pierced sides. The western portion is both a little longer and wider and is formed by an oak canopy or baldacchino. The Sylvester aisle was presumably erected at the expense of that family. As already explained, it was originally detached. The earliest of the many tombs is dated 1568. Under the fourteenth-century St. Thomas's Chapel, the floor of which is some feet higher than the rest of the building, there is an Early English crypt with a plain vaulted roof springing from circular shafts with moulded caps. It is surmised that the Tanfield Chapel to the north of the chancel was the Lady chapel, as Anthony Wood states the Guild of Our Lady at Burford did at their cost and charge build a chapel of Our Lady annexed to the parish church out of devotion, and provided a minister to teach the children freely. The most conspicuous feature of this chapel is the elaborate tomb to Sir Richard Tanfield and his wife (1625). The long poetic inscription which was composed by Lady Tanfield ends thus:—

"Love made me poet and this I writt,
My hearte did doe it, and not my wit."

This canopied tomb is surrounded by an interesting iron grate.

The central tower with its slender spire is interesting as not only including the earliest work of the entire structure, but also as faithfully recording the difficulties that beset the Norman builders. The tower originally consisted of two storeys, then another storey was added, and finally a spire. The height of the Norman roof is marked inside by a string-course. Early in the thirteenth century the north and south walls were pierced by Early English arches. But the additional weight consequent on raising the tower made it necessary to reduce the size of these openings. The side walls were also underpinned and new foundations inserted. Mr. Harold Brakspear, F.S.A., who gave an account of the church, suggested that the tower and spire was rebuilt by Christopher Kempster, who carried out a similar work at Abingdon church, and who bequeathed money for the erection of a solar at Burford church.

Burford Priory.

The history of the priory can be traced back to the thirteenth century, when it was erected as a small Augustinian hospital. At the suppression it was converted into a residence. About 1625 it was rebuilt, and a similar thing occurred in 1808 when radical alterations were made in the plan. The front is interesting, as also is the Renaissance chapel on the south side, which is connected to the house by a gallery.

The excursion to Burford ended the Summer Meeting of the Royal Archæological Institute. The return to Oxford was typical of the exemplary punctuality which obtained throughout the whole of the ten days. The programme stated that the special train bringing the party back from Witney to Oxford was due to reach Oxford at 6.40 P.M. It was at that precise minute that the train drew up at the platform. Every credit is due to the organising committee, and more particularly to Mr. G. D. Hardinge-Tyler, M.A., F.S.A., secretary, for the judgment and skill shown in mapping out the splendid programme and in keeping so rigidly to the time-table. The party was a large one, being generally between 100 and 150, yet to the best of our knowledge there was not a single hitch.

MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

XV.—SPECIFICATION OF LARGE COLD STORES.

IT is difficult to lay down hard and fast rules for the drawing up of specifications in connection with cold stores, as so much depends on individual conditions. That this is true will have been obvious from a consideration of those articles in which we have dealt with the different refrigerants, and also of those where the various insulations have been discussed. Very seldom indeed, it will be seen, does it happen that the same specification, or even the same form of specification, may be utilised without alteration.

Accordingly, all that can be done in a general discussion of the subject such as this is to indicate those points which are of most importance, and to show how they are usually dealt with. With this end in view we shall begin by taking the insulation.

The principal data with regard to materials used, styles of construction, heat leakage, &c., have already been given, and it will be remembered that the result of our investigations showed that, for ordinary work, the most suitable insulating materials are silicate cotton and granulated cork. Charcoal, it was agreed, may also be employed, but it is not so popular as the other materials on account of the low resistance which it offers to the spread of conflagration. It was further concluded that air spaces, while being beneficial as preventatives of dampness, are not commercially suitable as insulators.

Bearing these points in mind, it will be quite easy to draw up a specification which embodies one or other of the styles of construction which we have advocated. In most cases the insulation forms a lining to outer walls of brick; and on this basis, assuming further that the establishment is laid out in two storeys, we may proceed somewhat as follows (for a common storage temperature of 32° to 35° F.).

Specification of Insulation.

Insulation of Walls.—Where the insulation is against a brick wall, 2-inch by 1-inch grounds are to be spiked to the wall at 2-feet centres. On these one layer of 1-inch T. and G. boarding is to be nailed with the boards laid horizontally, and next to it 6-inch by 2-inch studs are to be erected at the same centres as the 2-inch by 1-inch grounds, and framed with 6-inch by 3-inch heads and sills. The spaces between the studs are to be filled with silicate cotton or granulated cork, properly packed under inspection, and to be sheeted in with two layers of ¾-inch T. G. and V. matching, the one set of joints running vertically and the other horizontally, and having one course of approved waterproof insulating paper (two-ply) between.

Note.—If the walls are damp, two layers of ¾-inch T. and G. boarding should be substituted for the one layer of 1-inch T. and G., and waterproof paper should be placed between them. This prevents damage to the silicate cotton or cork.

Insulation of Floors.—To be similar to that employed for walls except that 1½-inch T. and G. flooring, with insulating paper below, is to be used instead of the two layers of ¾-inch T. G. and V. matching. In addition, the floor boards are to be covered with one layer of coarse canvas, and on this 1 inch of asphalte is to be floated, the same material being flashed up the sides to a height of 9 inches all round.

Insulation of Ceilings above Ground Floor.—The joists are to be 9 inches by 3 inches, spaced at 21-inch centres, and sheeted on the underside with one layer of ¾-inch T. G. and V. matching, on the top side with 1½ inch T. and G. flooring, which would be covered with asphalte as before, the same material being flashed up the sides to a height of 9 inches all round. The space in between the joists is to be filled loosely with silicate cotton or granulated cork.

Insulation of Ceilings above First Floor.—The joists to be 6 inches by 2 inches for spans below 12 feet, and 9 inches

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by 2 inches for spans above, sheeted on the inside with two layers of ¾-inch T. G. and V. matching, with one course of insulating paper as above between, and on the outside with one layer of 1-inch T. and G. boarding; the space between the joists to be filled in with insulating material as before.

Doors.—All doors are to be splayed, hung on heavy gate-hinges (preferably with spherical bearings) and carefully fitted to their respective frames, a joint being made with white felt all round. They are to be fastened by fasteners of approved design, preferably of the lever type, and to be insulated in the same way as the walls. All sills to be of oak and the clear opening in each door is to be 6 feet by 2 feet 9 inches.

Note.—Where barrows or trucks are wheeled in and out, sloping pieces of timber should be specified, which can be placed on either side of the sill, as the latter, for a splayed door, naturally projects above the floor. It should also, if churns are to be rolled into the store, be covered with a piece of chequered floor-plate.

Where the door exceeds 36 inches in the clear width a castor should be supplied running on an iron quadrant fixed to the floor in order to take the weight. It is also advisable to insulate large doors with granulated cork, as this is lighter than silicate cotton.

Insulation of Partitions.—To be composed of 4 inches of silicate cotton or granulated cork between layers of ¾-inch T. G. and V. matching, one on each side, the studs being 4 inches by 2 inches and spaced at 24-inch centres.

Air Ducts.—To be constructed of ¾-inch T. G. and V. matching nailed on suitable runners and fitted at the places shown with teak regulating slides, each giving a clear opening of 5 inches by 10 inches.

Air-Cooling Chamber.—Insulation of walls and ceiling to be constructed in the same way as that of walls of cold room, the floor being formed by the ceiling of the cold store. The floor is to be lined with 5 lbs. lead, same being flashed 6 inches up round sides, and those portions of the sides adjacent to the coils are to be covered with No. 9 zinc. The lead is to be supported on deal boarding, suitably sloped towards one end, where an outlet with strainer attached is to be provided for the water of condensation, which is to be carried to the nearest drain by means of composition piping having a " U " bend to prevent ingress of air. Plug doors for inspection and de-frosting to be provided where shown and to be insulated and fastened similarly to the main entrance doors in cold rooms.

Fan Framing.—Suitable framing to be erected as shown to carry fan.

Note.—The thicknesses of insulation have been given, assuming ordinary storage temperatures; but if these are to be below 28° F., then 8 inches or 9 inches instead of 6 inches of silicate or cork should be specified. It is as well to increase from 6 inches right up to 9 inches, ignoring intermediate thicknesses, as there is very little extra expense, owing to the standard sections in which timber is supplied.

Another point which requires settling for individual plants is the size of the joists, as this naturally varies with the span and with the load to be carried. In some cases the latter is quite considerable if the building has an additional storey above the ground floor, and account must also be taken of the weight of the floor itself. Silicate cotton, it will be remembered, packs at 14 to 15 lbs. per cubic foot and granulated cork at about 6 lbs.

Very frequently also bar work carrying a large weight of meat is supported from the insulated ceiling, and in such a case the design must be arranged to suit the load. The hangers carrying the bars are fixed either to the joists themselves or to iron plates carried above them.

Refrigerating Machinery and Cooling Appliances.

In specifying the machinery it is, as already indicated, good policy, with a view to obtaining the best possible installation for the least possible expenditure, not to hamper the manufacturer in the smaller details, but to leave the system and arrangement of the plant to him, the interests of the purchaser being adequately protected by a stringent guarantee. At the same time it is as well, for the purpose of reference, to ask each tenderer to state what system he is adopting and what exactly he is providing.

The guarantee should include the duty to be overtaken by the machine, and this will be most safely stated in terms of the work to be done in the cold stores themselves. Plans will in the majority of cases be sent out with the specifications, and, if this is so, either the space available for cold rooms should be indicated or the outlines of the rooms themselves should be sketched out. The tenderer will then know what cubic feet of space his machine will have to deal with, and he should also be told how much of this is to be maintained at one temperature and how much at another. Besides this, he should be told what weight of produce is to be placed in each chamber daily and he must be asked to guarantee that the machine quoted will cool this weight to the specified temperature, and also maintain at the same temperature the produce cooled on previous days. The nature of the insulation being clearly stated, the guarantee will then be perfectly binding.

To take a concrete example, the actual wording would be somewhat as follows:—" The contractor must guarantee that the refrigerating machine and coolers supplied will, in the course of one day's run of nine hours, be capable of maintaining the rooms shown on plan when partly filled with goods brought in and cooled on previous days at their respective temperatures, namely:—Room No. 1, capacity 9,650 cubic feet, temperature 32° F.; Room No. 2, capacity 8,570 cubic feet, temperature 32° F.; Room No. 3, capacity 2,700 cubic feet, temperature 24° F.; Rooms Nos. 4 and 5, capacity 1,350 cubic feet each, temperature 24° F.; Rooms Nos. 6 and 7, capacity 1,350 cubic feet each, temperature 35° F., the insulation being as specified; and, further, that at the same time, and during the same run, it will cool 12 tons of produce from atmospheric temperature to 32° F. and 3 tons from atmospheric temperature to 24° F."

It will be noticed that only a nine hours' run has been allowed for in the above form, but, if it is decided to run the machinery continuously, twenty-four hours can quite easily be substituted. In that case, however, it would be necessary to have the compressors wholly or partially in duplicate and to have all air-coolers and condensers arranged in separately controlled sections, so that each section can be taken adrift and examined without deranging the general working of the plant. This arrangement, indeed, although not strictly necessary in ordinary circumstances, is a very great improvement, and with large plants becomes a necessity. A very good scheme is to have three compressors, each of half the requisite capacity. Two of these can then be run continuously, and the third kept as a stand-by.

In any case it is always worth while, whatever the duty of the plant, to get alternative tenders for a single compressor just able to overtake the duty and a set of three, any two of which can carry out the work between them. An additional advantage of the latter system, which is, of course, the more expensive of the two, is that in the winter, when very little refrigeration requires to be done, only one compressor need be kept going. Great economy in running is thus effected.

Having once decided (the decision resting mainly on the amount which the purchasers are willing to expend on initial outlay) whether duplicate or stand-by compressors are to be put in, and the form of guarantee being definitely fixed, all that remains to be done is to enlarge the specification along certain definite lines, which can be followed in all cases.

For example, tenderers should be asked to state exactly what system of cooling they advocate for each room in the establishment, it being pointed out to them that in all rooms designed for temperatures above freezing, forced air circulation is a *sine quâ non*, although in those for lower temperatures it may be left to their discretion. For reference purposes they should also be asked to specify fully what size of fan they propose to put on to each room and what amount of piping, also what the internal diameter of the piping is to be and its weight per foot run. From these particulars an exact comparison can be drawn up between the tenders, more especially if it is stipulated that separate prices for the air-cooling arrangements are to be submitted. The comparison can be made even more exact if the quantity of condensing surface to be supplied per ton of refrigeration is defined. This, it is true, is rather an infringement on the manufacturer's province, but as condensers for the larger plants are practically all of the same kind—namely, the surface evaporative—perhaps it is permissible. Should this limitation, then, be imposed, a suitable figure is 220 feet of 1½-inch pipe or 300 feet of 1-inch pipe per ton of ice-making capacity.

It should be further specified that there should be one complete pipe system for each room, capable of being independently controlled from the engine-room, and isolated, if need be, while the plant is running; also that all pipe work should be coated with two coats of an approved bitumastic paint and, where it is exposed to atmospheric temperature, should be properly insulated with cowhair felt bound with canvas, or boxed in with silicate cotton. All joints should be made by means of male and female spigoted flanges and only approved jointing material should be used.

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In addition, it should be made clear that the manufacturer is to deliver his plant on the site and to erect it, and that he must leave his erector for such time as may seem desirable (usually a week to a fortnight) to instruct the engineer, who is to have charge of the plant, in its operation. He should also bind himself to provide all the usual accessories in connection with the machinery, including an adequate number of cocks and valves, pressure gauges on the evaporator side and on the condenser, one thermometer in the brine flow-pipe and one in each return pipe (if brine circulation is used), also one or more in each cold room. The latter should be of the right-angled type already described, which allows the temperature to be read off from the outside; and if a first-class job is required, one of the electrical or other systems which have been described might be included. All regulating or expansion valves, it should be mentioned, have to be protected on both sides by shut-off cocks. This is because, on these valves, which are very delicately made, depends the proper working of the system, and, accordingly, it is highly essential that they should be readily accessible without shutting the plant down.

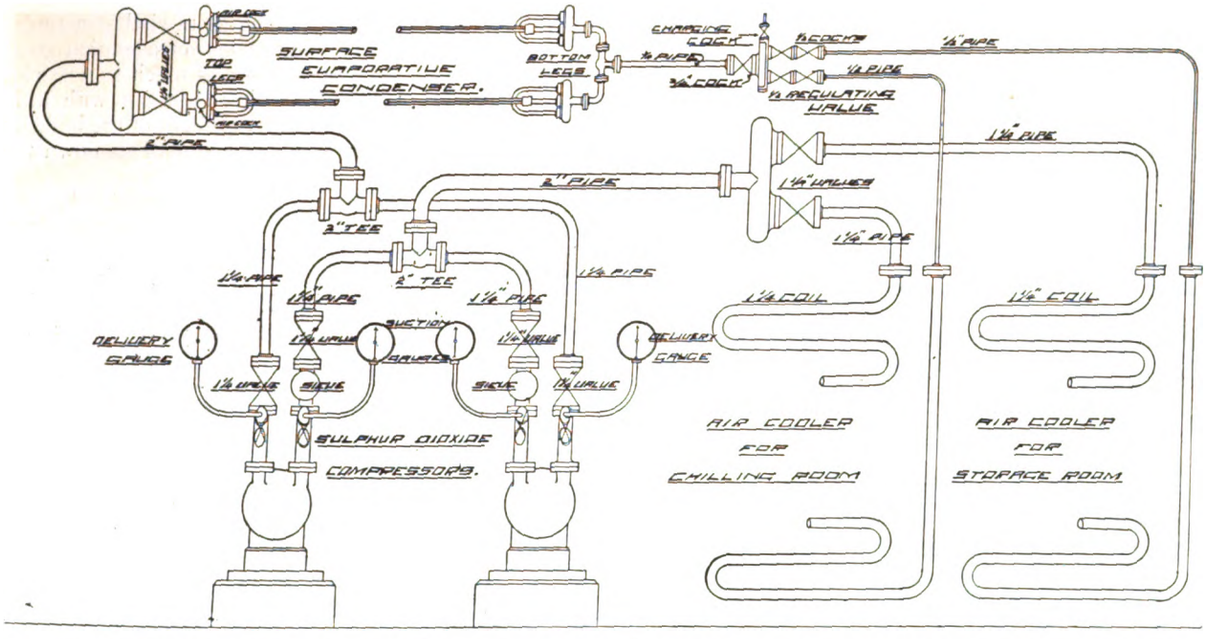
Other sundries which must be included in the tender are a complete set of spanners and keys (and pinching-bars for large compressors), holding-down bolts, a first charge of the refrigerant, and a first charge of calcium chloride sufficient to make enough brine to fill the system, if it so happens that brine is included. Both the latter should be inserted by the erector.

With regard to spares, it is not usually considered necessary, with good firms, to ask for an excessive supply of these. Sometimes it is as well to include in the specification a spare set of packing, with spare valves, springs and a supply of jointing, also (with refrigerants demanding a high pressure) a moderate quantity of gas to compensate for leakages; but in most cases these can quite well be ordered through the erector. Some engineers, it is true, like to have spare pistons, brasses, &c., on hand, but in the writer's opinion this is quite superfluous if the machine is of good design.

Foundations should always be supplied by the builders to drawings made by the engineer, and the water connections to the condenser may be given to the engineer, if thought fit, or to a plumber. If the latter, then it should be defined that the engineer supplies the inlet stop-valve to the condenser, and that from there to the mains and from the waste outlet to the drain the work is to be done by the plumber. Polished guard-rails should be fixed round all machinery and exposed belt drives, and these are usually supplied by the engineer and included in their tender.

As far as auxiliary plant is concerned, it should be stated that the engineer is to include in his estimate for the two circulating pumps one for condenser water and the other for brine (the latter being omitted in direct expansion work), and it saves trouble if the motive power and transmission gear, including shafting, belts and pulleys, are all supplied by the same firm. These will be dealt with under a separate heading, as will the bar work and hanging arrangements used in meat stores and abattoirs.

Finally, to explain the numerous references which have been made to shut off cocks, &c., a diagram is given in Fig. 47 showing how the connections would appear in a typical sulphur dioxide refrigerating installation applied to cold storage. In this case there are two horizontal compressors shown diagrammatically in end view, and it will be seen that both deliveries and both suctions are connected together by cross-over pipes. Starting with the delivery, we find that there is a $1\frac{1}{4}$-inch valve above each compressor by means of which either can be shut off at will. Afterwards the deliveries are collected together at a tee-piece, from which a 2-inch pipe leads to the duplicate atmospheric condensers, the gas being distributed to these at the top through cast-iron headers. Either of these can be shut off by the stop-valves shown. Leaving the condensers, the gas, having been liquefied by the action of the cooling water, is collected by tee-pieces into a suitable $\frac{3}{4}$-inch liquid pipe, through which it flows till a cast-iron header is reached, where it divides into two courses. One of these is through the chilling room


SURFACE EVAPORATIVE CONDENSER.
BOTTOM LEGS
2" PIPE
2" TEE
2" TEE
1¼" PIPE
1¼" PIPE
1¼" PIP

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) has an appreciative article on "A Notable Work of Decoration," which is that of the Paulist Church, New York, by William Laurel Harris, with the collaboration of Stanford White, John La Farge, and Augustus St. Gaudens. Views are given of some of the main portions of the decoration. Maintaining the ecclesiastical character of the issue our contemporary's principal illustrations are of the reredos, Trinity Cathedral, Cleveland, Ohio, of which C. F. Schweinfurth is the architect, and which is reminiscent of Winchester; the mortuary chapel at Woodlawn Cemetery, Detroit, Michigan, by Albert Kahn; St. Andrew's Methodist Episcopal Church, Philadelphia, C. E. Schermerhorn, architect; and the first Congregational church, Boulder, Colorado, of which Messrs. Maclaren & Thomas are the architects.

Berliner Architekturwelt (Berlin) is devoted this month to illustrations of some of the more notable exhibits at the recent exhibition at Berlin-Baumschulenweg of terra-cotta, cement and lime industries as applied to building. Needless to say these are mostly "new art" in feeling.

The *Architectural Record* (New York) sends us a "Seaside Number," which is wholly devoted to a wonderful collection of photographic views of American seaside homes of great variety of treatment.

Construction (Toronto) gives its principal attention this month to the instruction of its Canadian readers in English domestic architecture, examples of Mediæval half-timbered work, garden suburbs and English low-cost houses, and suburban development in England, also illustrating the design of the modern small house. Finally there is an article by Mr. Raymond Unwin on town planning, dealing with both Continental and English examples, which he delivered as a paper before the Society of Architects. Canadian work illustrated includes competition designs for a national memorial monument to be erected at Halifax, Nova Scotia, new premises for the Bank of Montreal, Toronto, and a house of Georgian character at Toronto.

Engineering Record (New York) has an interesting article on the high-pressure fire protection system at Oakland, California. Most of the issue is concerned with purely engineering subjects, but there is some interest in the account of the extension of the Columbia Building, New York, from a height of 158 feet to 195 feet.

ILLUSTRATIONS.

ARCHITECTURAL ASSOCIATION ANNUAL EXCURSION, 1910.

THE views illustrated are of buildings visited by the members of the A.A. excursion this year, and are referred to in our description of the proceedings.

FIRST CHURCH OF CHRIST SCIENTIST, SLOANE SQUARE.

THE First Church of Christ Scientist in Sloane Terrace is the first church of this denomination constructed in London. This religious movement is gaining ground so rapidly that it may in the near future be of especial interest to architects and builders. The church in Sloane Terrace is faced with Portland stone resting on a plinth of granite. It should accommodate at 5 superficial feet per person 1,600, but a more liberal view of seating has reduced the number to about 1,200 people.

The building takes up the whole breadth between Sloane Terrace on the south and Wilbraham Place on the north. It has a clear span of 72 feet, with a spacious gallery supported by cantilevers; the main walls are set back from the streets, below the level of the gallery, to afford proper light and ventilation to the rooms below the church. The main floor slopes away from the readers, rising as it recedes one foot in every 7 feet. This expedient, while enabling the congregation to get a better view of the readers who conduct the service, was adopted more with the view of avoiding stairs, out of consideration for invalids and infirm people. The entrance to the church, with its axis lying east and west, is only 4 feet below the level of the church at the west end, and the entrance to the reading-room, with its axis lying north and south, only 3 feet above the floor of the reading-room at the east end. This difference of 7 feet, augmented by the slope of the church floor, gives a good height to the reading-room, which measures 60 feet by 30 feet. The sloping floor might be adopted with advantage in all churches where processions and recessions form no part of the ritual. Except the body of the church itself, the building can hardly be regarded as a type suited to the full requirements of a Christian Science church. It has been found desirable, for instance, to separate the public reading-room from the church and to considerably enlarge the Sunday-school accommodation. The rooms below the church might possibly have been planned to greater advantage if these requirements had been known from the first. The particular style of architecture for a Christian Science church should present no difficulties. The very early churches were mostly pagan temples converted into churches; when constructed as churches they exhibited many Eastern features. Then came the Byzantine form of church, a form retained in a measure by the Greek Church to this day, but classicised by the Roman section of the Church until the pointed arch, passing through Sicily into Italy, laid the foundation of Pointed architecture, which flourished throughout Europe until the period of the Renaissance. The tendency at the present time is for the Roman Church to return to its original Byzantine, and for all Protestants and Reformers to retain the Gothic style. This cursory glance shows that fashion dominates style in ecclesiastical buildings as much as in civil structures. On the exterior of the building under consideration great care was taken to avoid projections as much as possible, strings and sills of all kinds being cross-cut with little gargoyles, so as to avoid the disfigurement of the building by the rain washing the smoke accumulations down the face.

The architect was Mr. R. F. Chisholm, F.S.A.

The contractors were Messrs. Dove Brothers, Ltd. Messrs. Stewart & Co. executed the granolithic flooring, Messrs. Redpath Brown the ironwork, Messrs. Ewart, the copper roofing, Messrs. Rendle the glass roofing, Messrs. Haden & Co. the warming and ventilating and Mr. Middleton the electric lighting.

DESIGN FOR WELSH NATIONAL MUSEUM.

THE authors in their report stated that the materials for all external elevations would be the best Portland stone. The internal elevations in the open courts would be finished in "stuc." Internally the main hall would have stone floor and facing, but the columns, pilasters and staircase would be in marble. Otherwise throughout the building the finish would be in plaster and the woodwork in deal painted white. The floors and roofs would be constructed in ferro-concrete, and all the flats of the latter would be covered with asphalte. There are two passenger lifts at the main entrance to the building, a large service lift in the service court, to which vans and carts would have free and direct access, and a small express lift between the ground floor kitchen and refreshment room. A crane would be provided in the service court for hoisting heavy objects. The lighting is, as far as possible, from the top in the Exhibition galleries, and this would be controlled by white screen blinds. Steam would be supplied for purposes of heating, hot-water supply and kitchen apparatus. The architects of this design were Messrs. Macartney, Halley & Bacon.

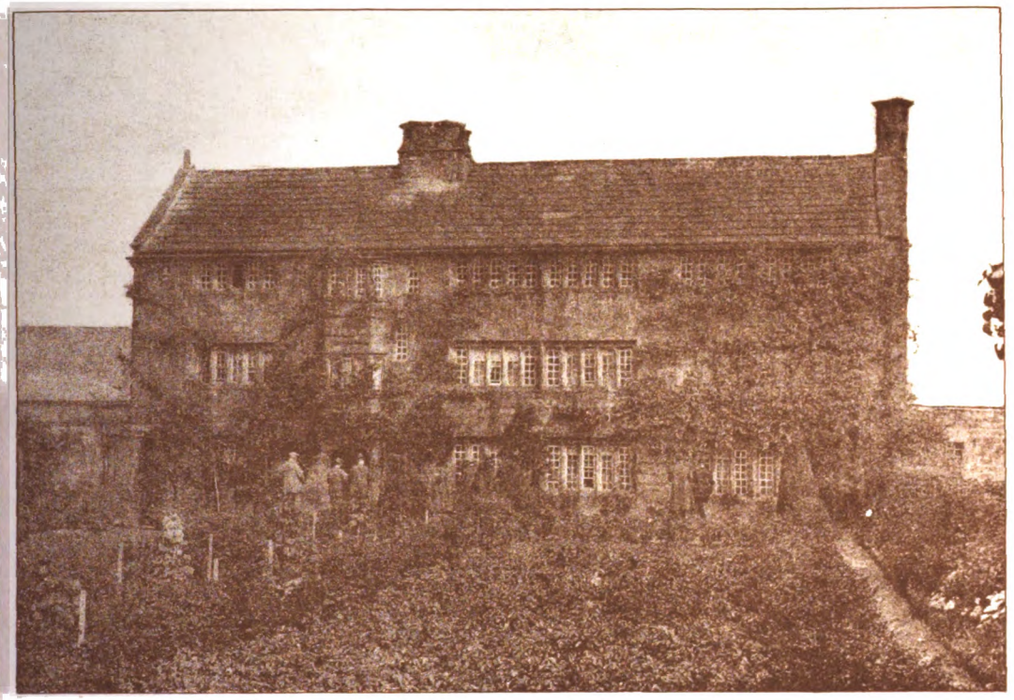
Mr. Alfred Drury, A.R.A., has been selected by the executive committee appointed to erect a granite statue to King Edward VII. in Aberdeen. When interviewed by a deputation Mr. Drury said he would readily undertake the commission, and would give it his attention as the primary work for the time. He calculated that it would take two and a half to three years to complete. He would contemplate the execution of the granite sculpture at Aberdeen, and his idea of the size of the statue would be about 10 feet.

Messrs. Chapman & Hall announce a second and thoroughly revised edition of Mr. Ewart S. Andrews's "The Theory and Design of Structures." This book was well received on its publication, and a very large first edition has been speedily exhausted.

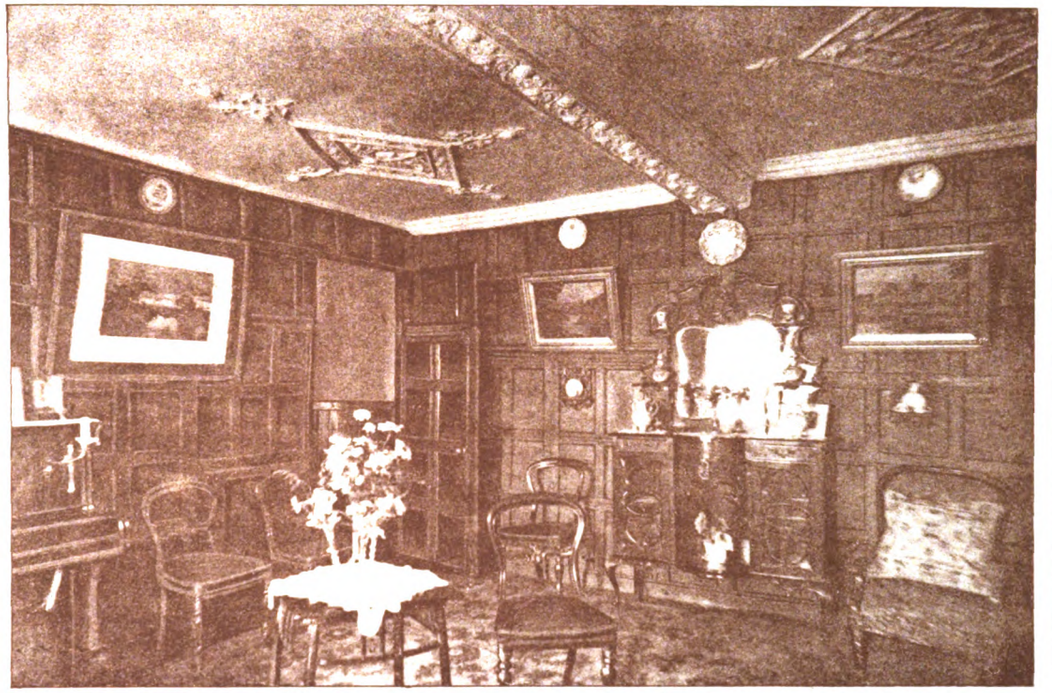
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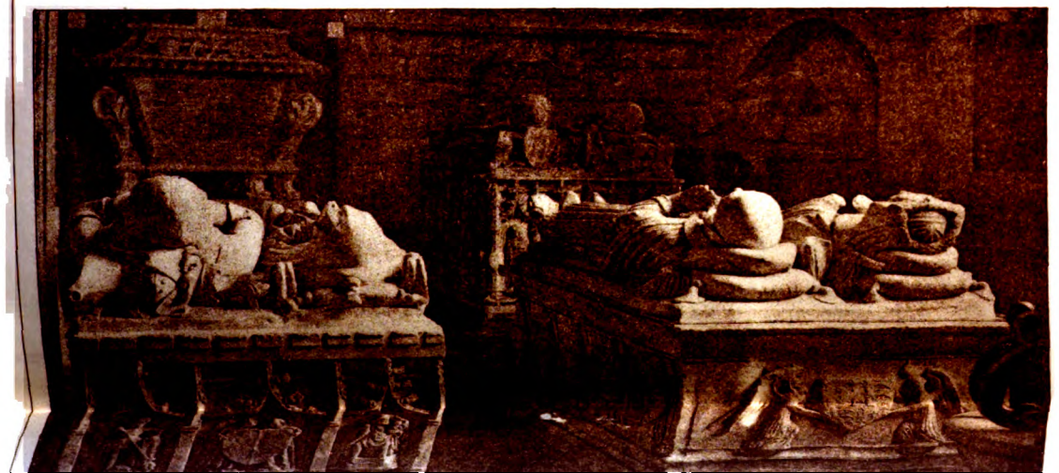
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Arthington Nunnery, Front.



Arthington Nunnery, Drawing Room.





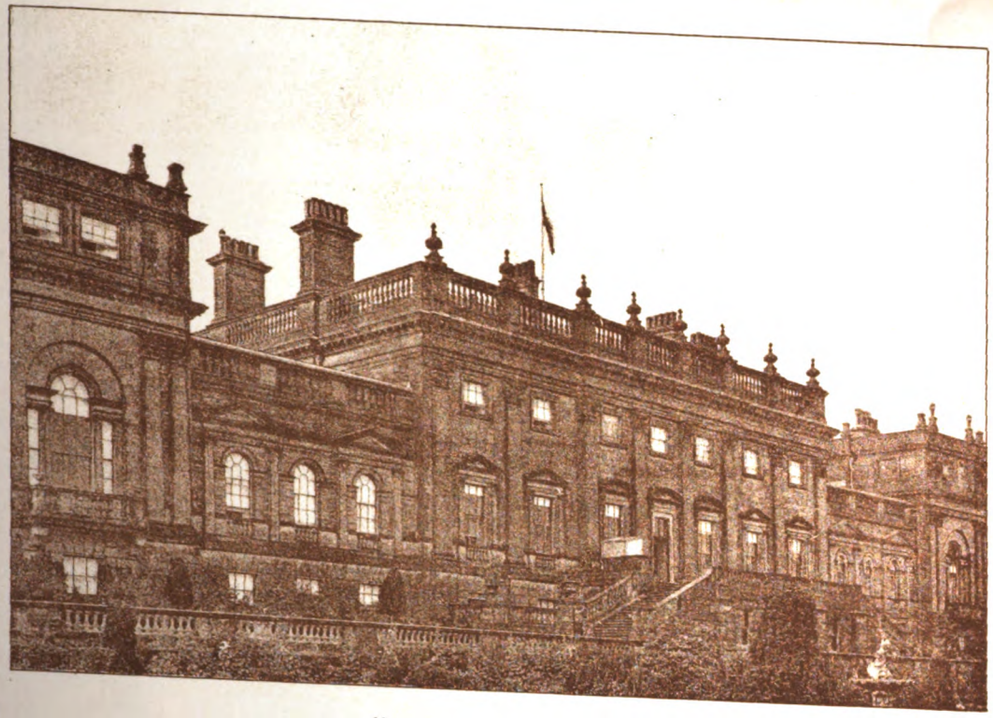
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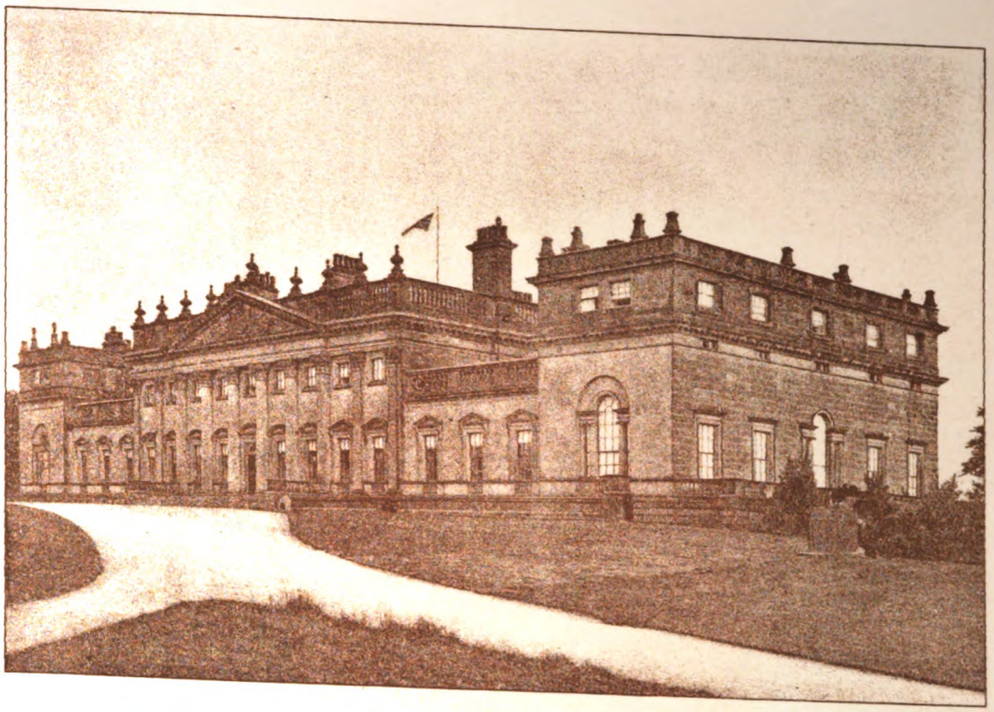
Tombs in Harewood Church.



Fountain's Hall, South Front.



Harewood, South Front.



Harewood, North Front.

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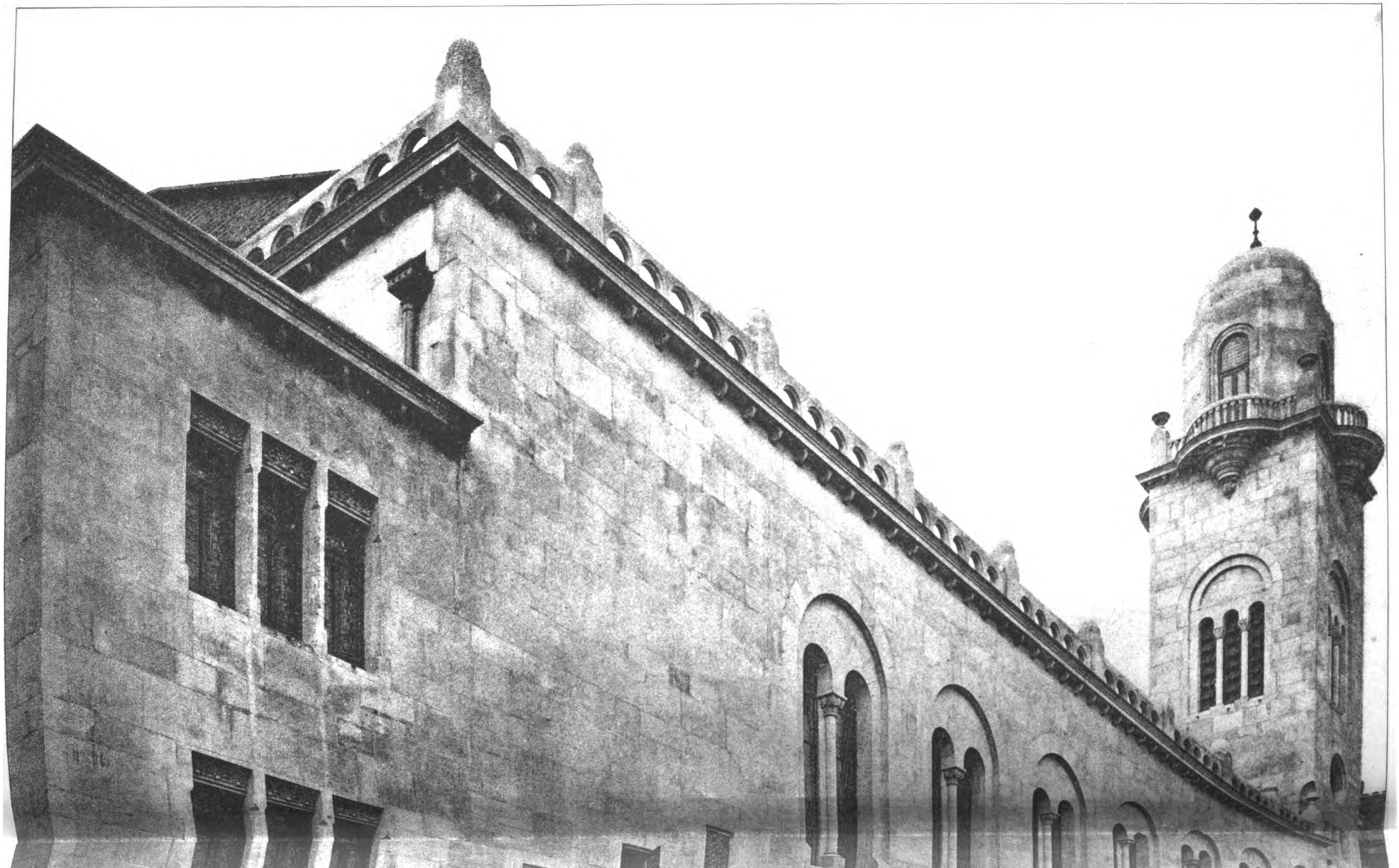
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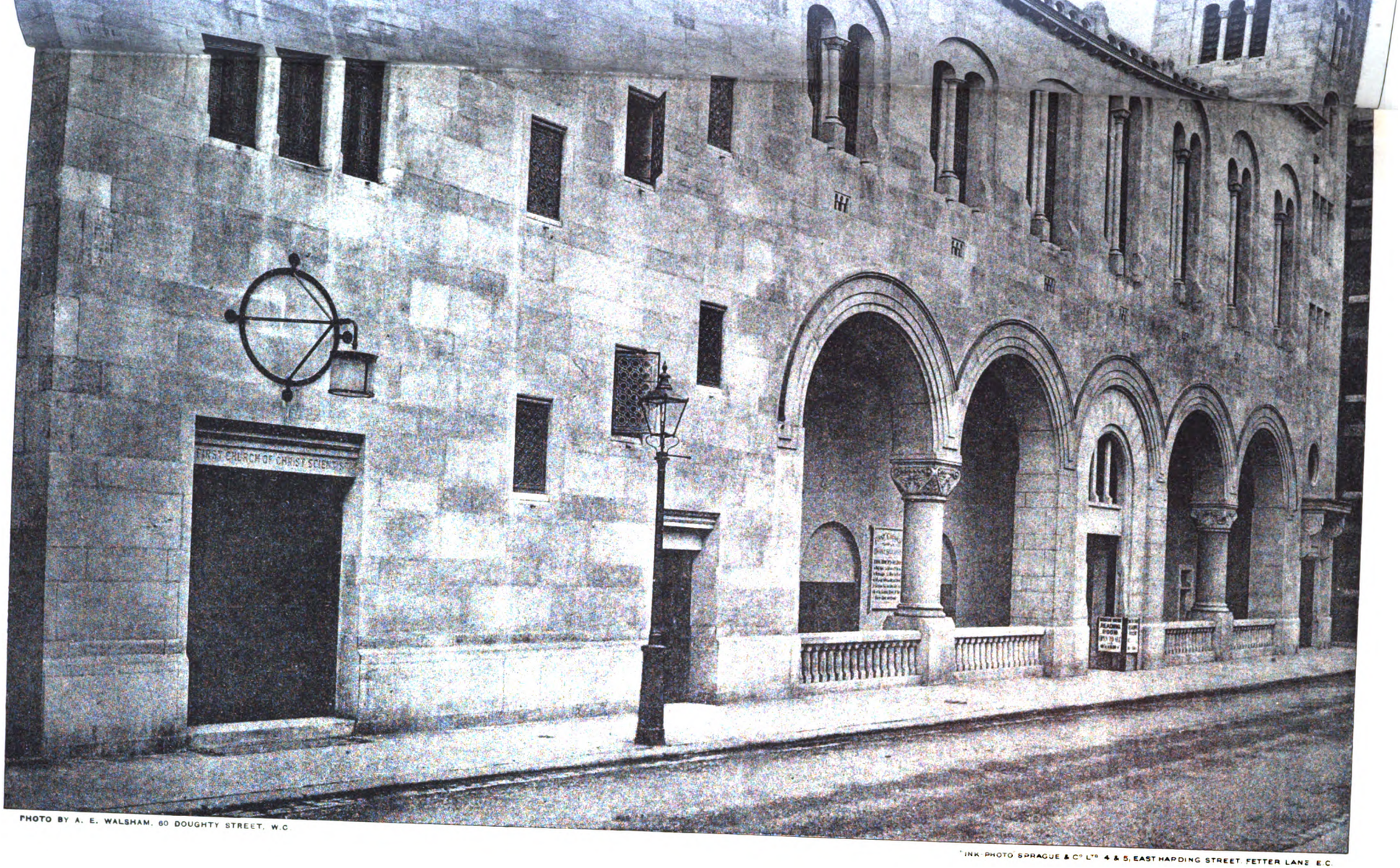


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FIRST CHURCH OF CHRIST SCIENTIST, SLOANE SQUARE, S.W.

Mr. R. F. CHISHOLM, F.S.A., F.R.I.B.A., Architect.

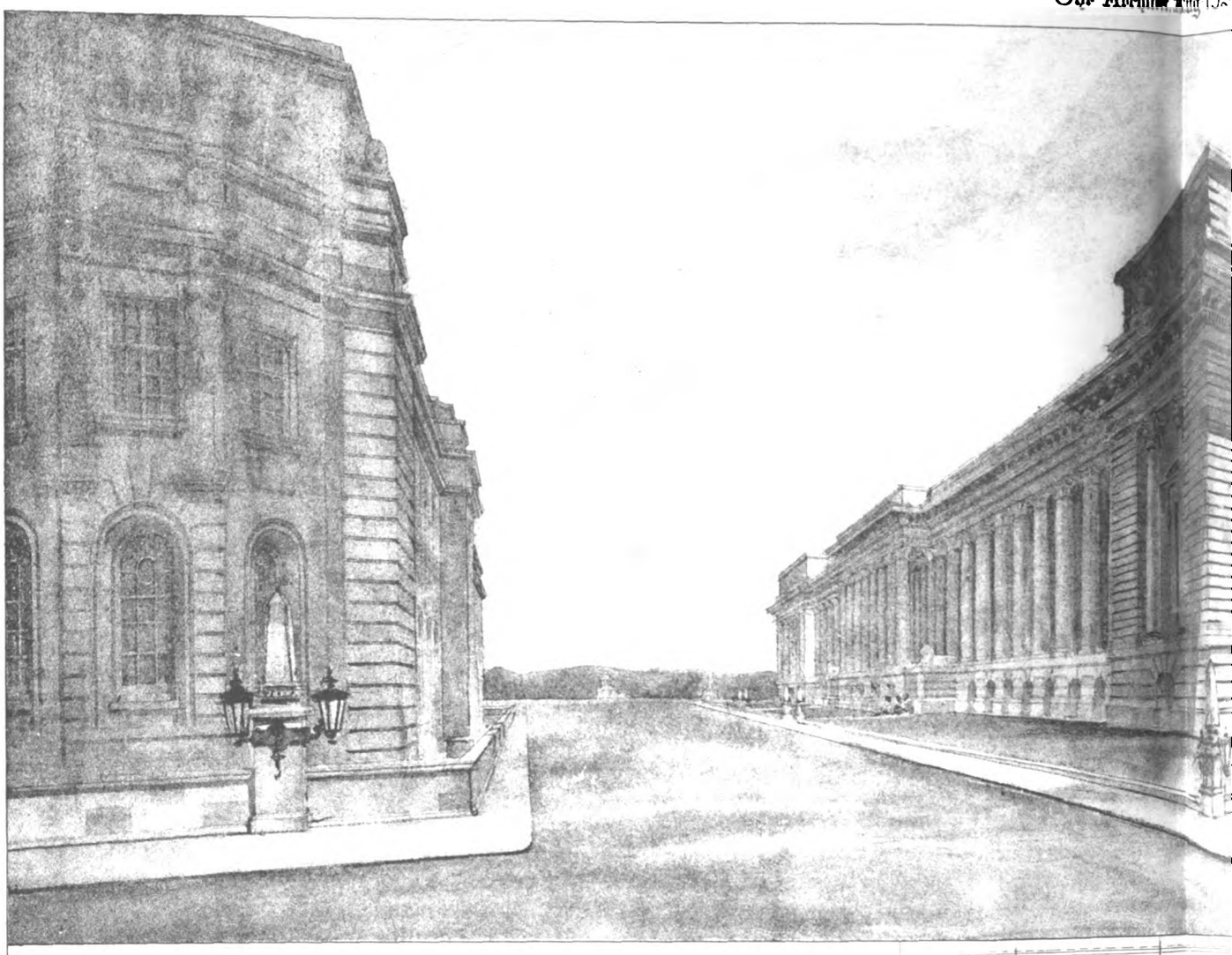
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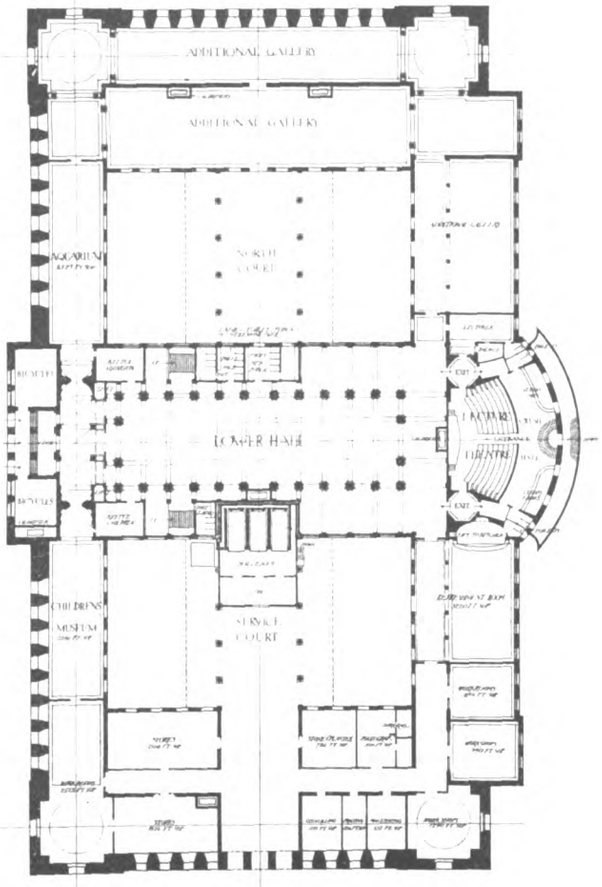
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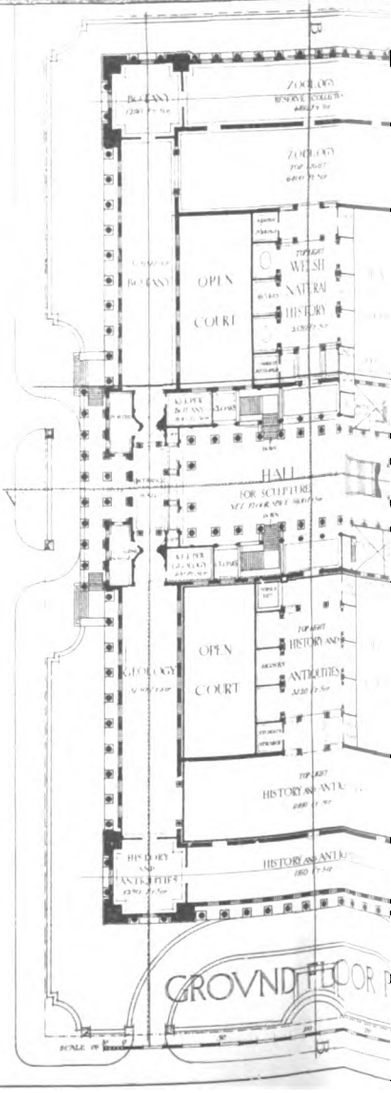
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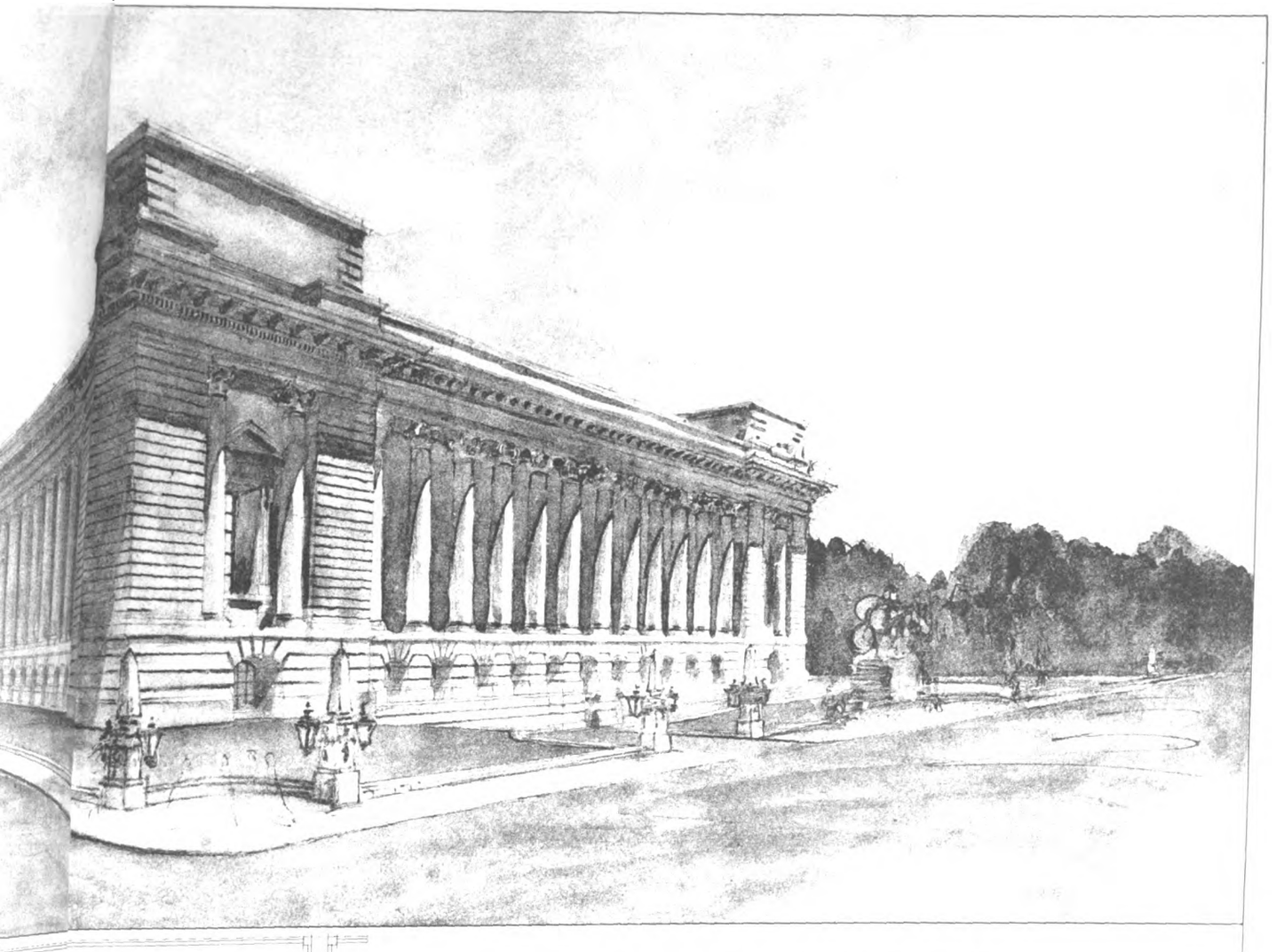
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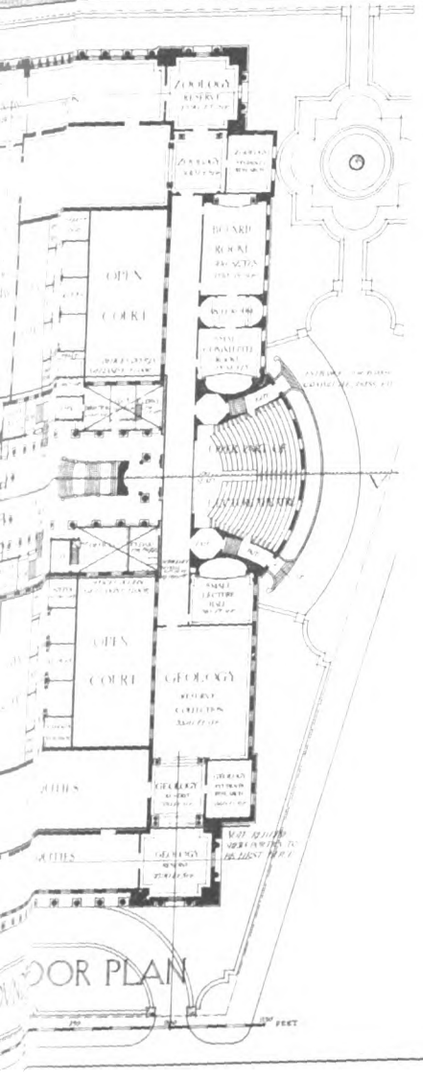
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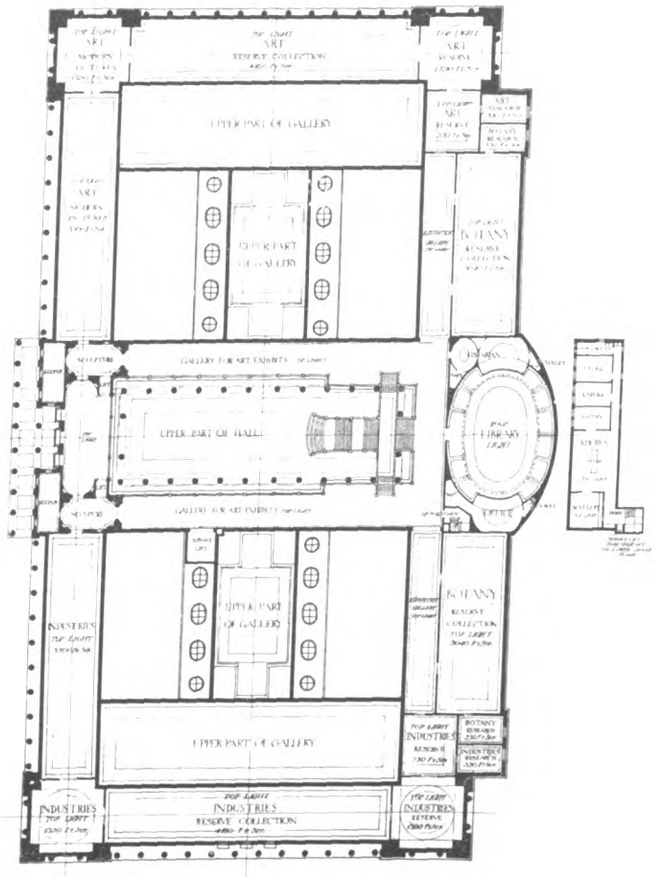
By Messrs. MACARTNEY HALL

Aug 19th 1910.





OOR PLAN



FIRST FLOOR PLAN

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NATIONAL MUSEUM OF WALES.

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FAN VAULTS.*

(Concluded.)

IN the porch of Hillesdon Church in Buckingham, a dome is substituted for the pendant, to the great advantage of the construction. The curve of the dome is a continuation of the arch of the conoid, so that the diagonal section is no longer an arch with a horizontal crown as in the vaults we have been considering. The four triangular spandrels are still flat. This is the diagonal section.

At Hereford in the chantry chapel of Bishop Audley, on the south side of the Lady chapel, there is a vault of this kind on a polygonal plan. There are little fans in the angles of the polygon, but the stellar tracery in the centre of the vault is worked on the surface of a dome. The plan is a little over half an octagon, and the panelling of the arch opening into the chantry from the Lady chapel continues the design of the fan vault. The slide shows the tracery and the carved bosses on the central part of the vault. On the central boss is a representation of the Assumption of Our Lady.

The vaults I have been describing so far are all variations of the fan vault with separate conoids, leaving a flat spandrel in the middle.

But a better method of overcoming the difficulty with the spandrel was to suppress it altogether and let the conoids intersect. Thus the conoids are pared down as it were until they are rectangular instead of circular on plan. A small example of this kind of fan vault on a square plan is the central part of the vault of the Redmount chapel at King's Lynn. Here the diagonal arch governs the form of the conoid, the other ribs are of the same curvature, but shorter, and the ridge is not level but rises towards the ring in the centre. All the other examples I know are oblong on plan. The vaults of King's College chapel at Cambridge belong to this class. In the vault of one of the chapels between the nave buttresses, for instance, the vault is an oblong on plan, but this matters little when the conoids are allowed to intersect, although it causes some trouble with the design of the tracery. In the King's College vaults the tracery is very stiff and not nearly so attractive as the Gloucester work. The Tudor flower which decorates the circular ribs of the fans and the large boss in the centre are often met with in late work. The high vault is no less than 44 feet span. It is similar in its details to the vaults of the side chapels. Between each bay there is a strong moulded transverse arch to prevent the vault buckling. The generating arch is four-centred.

The vault of the Lady chapel of Peterborough abbey church is certainly the work of the same designer. The details are almost exactly the same, but there are no transverse arches. These are replaced by spandrel walls, fulfilling the same purpose of stiffening the vault. From the view of the upper surface of the vault it will be seen that portions of the vault are built rib and panel fashion, while the more intricate parts of the tracery are sunk in solid stone. The horizontal surfaces of operation, necessary for the correct setting out of the vault stones, are only partially removed.

The vault with intersecting conoids is easily applied to a polygonal plan. Examples are the apsidal chapels attached to St. George's Chapel at Windsor, and the chapel in St. Stephen's cloisters at Westminster. The vault of St. Mary's porch, Oxford, is somewhat similar.

The high vaults of the abbey church at Bath are intermediate between the vault with separate conoids, and the vault with intersecting conoids. The fans do not intersect completely, but leave a very small diamond-shaped spandrel between them. The rectilinear tracery is rather severe, but quatrefoliated circles are introduced around the top of the fans and in the spandrels. The ribs are very numerous, but are gathered in so as to spring from a small circular shaft. The generating arch is rather acute, as in most large fan vaults, in order to reduce the thrust.

The aisle vaults of Bath Abbey are something like the vault of the oriel in the hall at Christchurch. The fans partly intersect, and the spandrels have little pendants. The Christchurch vault is a very beautiful and interesting piece of work. The detail is delightful, especially the tracery on the pendants, of Flamboyant type. The fan opposite the conoid which springs from the central mullion of the window is not a conoid, but a rather flat dome, to suit the arch opening into the oriel; that is to say, the lower curve of the arch generates the conoids and the upper curve generates the dome. The great heraldic boss in the middle of the vault is very typical of Tudor vaults. Similar bosses are met with in St. Stephen's cloisters and in the vestibules to the aisles of Henry VII.'s Chapel at Westminster.

Another example of the fan vault with partly intersecting conoids is the well-known high vault of Henry VII.'s Chapel at Westminster, which is a fan-pendant vault of very complicated design. The pendant vault appears to have been evolved at Oxford. The first example is the elaborate lierne vault of the Divinity School, which was being built from 1445-80. The span is considerable, and it is vaulted as if it were divided into a nave with aisles, but the piers are omitted and the vault is supported by the haunches of strong transverse arches between each bay. This vault is so often described as a fan vault that I will try to explain why it is not a fan but a lierne vault. It will be seen that the ribs are spaced at equal angles with one another, but the ridges are level. This would not be the case if the ribs were of the same curvature, for they are of different lengths. If they were of the same curve the diagonal rib would rise higher; therefore this vault cannot be a fan vault, although it looks so much like one.

In the vault of the choir of Christchurch the aisles have barrel vaults and the nave a square lierne vault. The transverse arches are managed differently. The upper half of the arch disappears above the surface of the vault.

The high vault of Henry VII.'s Chapel was certainly suggested by these vaults. The general arrangement is like that of the vault of Christchurch, but fan vaults are used instead of barrel and lierne vaults. Here again the transverse arches disappear above the surface of the vault, but their position is marked by a hanging fringe of tracery.

The conoids of the vault, like those of Bath Abbey, do not entirely intersect, but leave a small flat spandrel, which is decorated by a pendant in the central bays. The side bays are so oblong that the spandrel is extremely small and only decorated with sunk tracery. This is the most elaborate of all fan vaults, but scarcely the most beautiful, although every detail is carefully thought out and perfect in its way.

The fan vault with circular conoids was extremely popular throughout the Perpendicular period, and it is amusing to notice the way in which the corbels of oriel windows, the bowls of piscinæ, and the stems of pulpits are often carved in the form of a traceried conoid. Delightful little fan vaults are often found beneath the canopies of niches, and at Maids Moreton, in Buckinghamshire, there is a doorway with a projecting hood over it supported on half-conoids fitting round the head of the door. There are one or two instances of purely decorative canopies carved to resemble fan vaults, such as the vault of the Beauchamp chapel at Tewkesbury.

We find a few vaults which are exactly like fan vaults except in one particular. The conoids are not circular in section, but polygonal. I hope you will pardon me if I call them pyramidoids. The beautiful vaults of Sherborne abbey church are of this class. They are constructed like lierne vaults with separate ribs and panels, but the main ribs are all of the same curvature except the wall rib, which is raised a little to allow of a larger clerestory window. The lesser ribs are of a slightly different curve. I should like to believe that this form of vault had been developed independently by making all the ribs of a lierne vault of the same curvature and spacing them at equal angles with one another, but a few details, such as the section of the vaulting shaft and the treatment of the springers, which is very peculiar, seem to be copied from the Gloucester vaults. The tracery, however, is quite original and beautifully designed, and there are carved bosses at the intersection of the ribs which are rarely found in fan vaulting. This is the vault of the nave. The vault of the choir is much earlier (1436-59), but similar in design. It is obtuse and has flying buttresses. The nave vault (1475-1504) is more acute, and unfortunately the flying buttresses are omitted. Span, 25 feet.

The vault of the north transept has even more elaborate tracery. It is square on plan. The chief difference in the tracery is the introduction of doubly-foliated arches in the panels round the upper part of the fan.

The vault of the choir aisles, part of the work of 1436-59, is rather different in effect, but it is constructed on the same principles and the details of the tracery and carving are similar. The bays are divided by sections of panelled barrel vaulting which serve to reduce them to approximate squares, but the real reason for the barrel vaulting is to suit the plan of the piers, which are very large and run right through and round the clerestory windows, while the arches are comparatively small and have few mouldings.

* A paper read on July 25 before the Royal Archæological Institute by Mr. F. E. Howard.

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The small vault of the north transept chapel at Sherborne is a regular fan vault, square on plan, with separate conoids, but constructed rib and panel fashion. Even the panels of the foliations in the flat spandrel are dropped in afterwards, and it is upon these panels that the square paterae are carved. The panels of the conoid, being fitted afterwards, are not convex like those of a regular fan vault, and thus the section of the conoid is not circular. I have not had time to go carefully into the question of dates, and it is quite possible that this vault may be the earliest of all the Sherborne work. If so, it would be a link connecting the Sherborne work with that of Gloucester.

There are two beautiful vaults in Devonshire which have polygonal conoids like those of Sherborne, but they are built in the usual manner of fan vaults with ribs formed by sinking panels into the surface of the vault. The vault of the Dorset aisle at Ottery St. Mary is designed exactly like a fan vault with intersecting conoids, but the horizontal ribs are not circular but polygonal owing to the shape of the pyramidoid. Of course, only the principal ribs of this vault are of the same curvature. The span is considerable, about 20 feet, and the vault is an exceedingly fine one, in five bays. The pendant bosses are unusual and effective.

Even more beautiful is the vault of the Lane aisle at Cullompton, in Devon (1528), evidently the work of the same hand. It will be noticed that the lower horizontal rib is polygonal but the upper one is circular. This is possible owing to the flatness of the surface at the upper part of the pyramidoid, where the angle between each face of the pyramid almost disappears. The bosses are composed of four angels with curiously scalloped wings standing back to back on a floral boss. They carry shields with emblems and merchants' marks.

Now I am going to take the late fan vaults of Oxford in chronological order. There is no example after the vault of the oriel in Christ Church Hall, built in 1529, until we come to the vault of the gateway of Wadham College, about eighty years later (1610).

It is rather a charming specimen of Jacobean work, with bold ribs and quaint pendants and strapwork. The gateway is oblong, and the solution adopted is that of the Lady chapel chantries at Gloucester. The quarter conoids are placed in the corners and do not touch, but they abut against a large flat spandrel.

The next in date is the beautiful vault of the porch of St. Mary's (1637). There seems to be no doubt that there was a Gothic porch on the same site, hexagonal on plan, like that of Chipping Norton, and with a fan vault. I am almost certain that the splayed arches, half-buried in the side walls, and the two lower stones of the springers, which were cut out of the same stones as the arches, are remains of the early sixteenth-century porch, which was probably replaced by the present one because it projected too far into High Street. This is the only theory I can find to account for the extraordinary way in which the vault springs not from the angles, but from points along the sides. The upper part of the vault is undoubtedly seventeenth-century work of a similar type to the vaults of St. John's College, which were also erected by Laud at the same time. The plan is half a regular hexagon and the conoids intersect, but the rose in the centre is a dome. The diagonal section is a semicircle to suit the entrance arch.

The vault of the passage from the front quad of St. John's into the second quad is part of Laud's building. It is a nice bit of work in two oblong bays with intersecting conoids and a pendant in the centre of each bay. These pendants are of Jacobean character, and the circles round the top of the fan are not foliated, but otherwise there is little to show that the vault is not mediæval work reused. The circles correspond with the Catherine wheels of St. Mary's porch, and the Flamboyant work also appears.

The passage under the garden front is similar, but much more elaborate. In addition to the pendant in the centre there are ten other little pendants hanging from the surface of the conoids.

The vault of the gateway of Oriel is a few years later (1640), and of very different character. It is in two oblong bays, with intersecting conoids, like the vault of St. John's Passage, but it is on a larger scale and the design is much stiffer. Still it is interesting work and far more suitable for a college entrance than the over-elaborate vaults of University and Corpus.

The fan vault of the staircase to Christ Church Hall, erected in 1660, is the most famous of all the Oxford fan vaults. The general idea of the thing is wonderfully fine, but the detail is very poor and shows an extraordinary lack of imagination. See how the same cusped arches are repeated in the two rows round the conoid, round the roses in the spandrels, and in the triangular spaces between. The ribs are so weak that they are of very little use in the construction. It seems to me that the builder must have worked from the old small-scale drawings of Wolsey's time; for the result is exactly what one would expect from a conscientious man working from an indistinct small-scale drawing with no full-size details to guide him. The plan is in four oblong bays with a central column. Transverse arches occur between each bay. The roses are domed, as in the vault of Hillesdon porch, but the fans do not meet; the small spandrels are flat.

The vault of Tom Tower is part of Wren's work of 1689. The detail is more interesting, but a little stiff and wiry. There is a large number of shields with the Royal arms and the arms of various benefactors surrounded by strapwork. A massive wreath of laurels bound with ribbons frames the huge circular opening through which the great Tom bell was raised.

Later still are the vaults of the gateways of University. They date from the building of the second quad in 1719. The detail is very wiry and the ribs are merely decorative. The best carving is to be found in the shields and strapwork. The vault of the older tower is in one oblong bay with intersecting conoids.

The vault of the other tower is in two square bays, but the plan is not quite rectangular owing to the curve of High Street, and so a small triangle of barrel vaulting panelled like the fans is introduced to fill in the small triangle which is left out each end. The spandrels of this vault are flat and have large bosses carved with acanthus leaves.

Later even than this is the vault of the gateway of Corpus, which appears to date from the remodelling of 1817. The work is not bad for its period; in fact, it may be a restoration of the old sixteenth-century vault, but this is not very likely. The tracery looks as if it were suggested by the vault of Tom Tower. This is the most modern fan vault in Oxford. Perhaps this is fortunate for Oxford, but at Cambridge, in Peterhouse, there is a very beautiful fan vault, designed by Gilbert Scott, in the oriel of the hall, built, I suppose, about 1870; and this brings the history of the fan vault down to our own day.

GAS HEATING RESEARCH.*

(Continued from last week.)

Condensing Stoves.

THESE stoves are often described as "gas-radiators" or "flueless" stoves, both of which names seem open to criticism. With the exception of a small number of types embodying open gas-fires from which the waste products are conducted to the main body of the "radiator," most of these stoves only give out a small quantity of radiant heat. The heating is almost wholly by convection, and this is the essential characteristic.

The air is heated by contact with the hot metal surface of the stove, and an upward current of this hot air draws continuously a fresh supply over the surface. The coils of the radiator are in effect a flue, and it is only in view of the fact that this flue is not usually connected with the room chimney that the apparatus can be called flueless. The flue has an important bearing on the whole design of the stove, as it depends almost entirely on its structure how far condensible products, such as water and sulphur acids, are removed from the gaseous combustion products before the waste gases pass out into the room.

The chief advantages claimed for this type of stove are:—

1. That the whole of the heat from the gas burnt, passing as it does directly into the room, is available for heating the room; whereas in ordinary stoves connected with a chimney quite 30 per cent. of the heat is lost.

2. It is also claimed that as regards the more injurious combustion products, chiefly sulphur acids, the condensed water removes these and only the comparatively harmless carbon dioxide passes into the room, and carbon monoxide, if formed at all, is only found in minute traces.

3. Another advantage claimed for this form of stove is that, owing to its not requiring a chimney, it may be put in any position in the room or house.

The objections usually put forward are that the stoves are

* Abstract from second report of the "Gas Heating Research Committee" appointed by the Institution of Gas Engineers in conjunction with the University of Leeds.

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unfit for use in any but well ventilated rooms, and that the better the ventilation the less is the amount of heat available for use in the room. The first objection is easily disposed of by the makers. Most of them refuse to supply such stoves for use anywhere but in halls or amply ventilated rooms. Unfortunately, such stoves can still be found in small badly ventilated workshops, and under other such conditions for which they were never intended.

There are several tests of this class of stove on record—e.g., by Mr. H. Leicester Greville, Mr. F. R. Branston, Sir T. E. Thorpe, and Dr. Rideal, chiefly relating to the percentage of carbon dioxide and carbon monoxide in rooms where these stoves are used, and also some figures relating to the proportion of the condensed sulphur acids. The conclusions are that, under good conditions of ventilation, they need not be regarded as injurious—would, in fact, be less so than the overcrowding of human beings under the same conditions.

How much of the heat is actually usefully applied has not been discussed. This will vary so much with the amount of ventilation maintained, with the size of the room, and the amount of free space in the room, that any data obtained under this head would be of little practical value.

The stove that was used during the progress of these experiments was of simple construction, having an open gas-fire, from which the hot products were led through eight vertical tubes to the shallow reservoir provided for the condensed water at the base of the stove. There were six Bunsen flames in the burner, which were controlled by a gas and air adjustment. The flames were surrounded by fire-clay fuel of the modern form, and the back of the fire was of refractory brick. There was a projecting hood, which helped to direct the products of combustion up the four middle tubes.

The shallow trough was connected to the stove base by means of an air-tight water-sealed joint. The cooled combustion products, from which much of the water they primarily contained had been condensed, then passed out into the room through a single hole 2 inches in diameter at the centre of the trough. A pan is usually placed on the floor under this hole to catch the dripping that is sure to occur after a few hours' use and the trough has filled, and also to catch the water that is condensed from the escaping products on coming into the cooler atmosphere. The stove was 43 inches high, 30 inches wide, and 14.75 inches deep from front to back. The open fire measured 6 inches by 7½ inches, and was faced with a cast-iron guard.

In order that constant and normal results might be ensured during the course of the experiments, the stove was put in regular use for a period exceeding one month. A ¼-inch hole was bored on one side of the base of the stove through which distilled water might be run when washing out the condensed water, which was run off through a tap attached to the under-surface of the water-seal in the trough.

Before lighting the fire any residual condensed water was run off through this tap. The tap was turned off and 300 c.c. of water were run into the trough in two portions, the first 150 c.c. being drained away and the second remaining in the trough to act as a seal. This was done after each experiment. A large porcelain dish was placed below the flue outlet to catch the condensed water in excess of what the trough would hold. A thermometer was placed at the flue outlet with the bulb inside to take the temperature of the outlet products.

Another thermometer was suspended 8 inches away from the surface of the stove, and was shielded from radiation from the stove by being surrounded by means of a cylindrical tube of asbestos 3 inches in diameter. From this, thermometer readings were taken of the temperature of the air coming in contact with the main body of the stove. The thermometer was sufficiently far away from the surface of the stove not to be affected by the hot air arising therefrom.

The experiments were conducted in a large room formerly used as a kitchen. There were five doors to the room, and it had one large window and an old-fashioned wide chimneyed fire-place. One door led upstairs, and this, and another at the opposite side of the room, were invariably kept open to ensure good ventilation. No door leading directly outside the house was kept open. The stove was placed in the centre of the room, and by means of thermometers distributed in different positions in the room a suitable distribution of the heat from the stove could be checked. The mean of these readings always closely approximated to the reading of the thermometer suspended near the stove.

The temperature of the room was varied by varying the extent to which the doors were kept open, the door leading upstairs obviously being of most use for this purpose. The windows in the room upstairs were kept open to allow the hot air and products of combustion to escape. The gas consumption was determined in a similar way to that already described in these reports—account being taken of temperature and pressure.

Sulphur Determination.—The modus operandi was as follows:—The stove having been lighted for some time, and all the necessary conditions for the particular experiment having been attained, the condensed water was quickly run off—the trough washed out with 150 c.c. of water, which was also run off, a further 150 c.c. was then added and left in the trough to act as a seal. During this operation, which lasted not more than two minutes, the stove was turned out, but immediately relighted at the end of the operation of washing out the condensed water. From this point the amount of gas consumed was determined.

At the end of the experiment the stove was turned out and the gas consumption noted. The condensed water in the base of the stove was run into the porcelain dish which contained the drippings from the flue hole, and the trough was further washed out with 150 c.c. of distilled water, the washings being added to the main bulk.

The amount of sulphur present in this liquid was determined in the usual way—i.e., by preliminary oxidation by means of bromine water and subsequent precipitation of the sulphates by means of barium nitrate solution.

During the whole of the time the stove was lighted a determination was proceeding of the total amount of sulphur present in the coal gas being used in the stove. A modified form of the Gas Referees' apparatus was used for this purpose. It consisted of a glass marble condenser followed by an air condenser, as in the Referees' apparatus; but to this was added a water-cooled condenser, to ensure a more perfect condensation. There was no rubber about the apparatus, all the joints being of ground glass. This form of apparatus gave very slightly, but consistently, higher results than the usual form.

These results were checked by comparing them with those obtained by Mr. Edwards, the Chief Chemist at the Leeds Gasworks.

(To be concluded.)

THE BERWICK SARCOPHAGUS.

THE Rev. James King, St. Mary's Vicarage, Berwick-on-Tweed, writes:—

It may be of interest to your readers to know that the sarcophagus unearthed in the Magdalene Fields, Berwick-on-Tweed, was found at a spot about a stone's throw from the old Edwardian Walls, and not far from the Royal castle of the Plantagenets. It bears the usual marks of a stone coffin—is composed of one block, with sides converging towards the foot, roughly hewn outside, but carefully chiselled internally, with a well-formed circular cavity for the reception of the head. The stone is close-grained hard sandstone, like that used in the Edwardian masonry; but except an ordinary chamfered edge, there are no architectural details for determining its age.

The old Edwardian Walls were abandoned in 1560 A.D., in the reign of Queen Elizabeth, and for above two centuries previously—namely, from the battle of Halidon Hill, fought in 1333 A.D.—the town had virtually been in the possession of the English. About 1120 A.D. David I., when Prince of Lothian, had a residence on Castle Hill, and erected the original church of St. Mary, near the spot where the sarcophagus was found. The land here is situated between an outer and inner fosse, and still bears marks of military outworks. The coffin, though not colossal, is of unusual length, measuring internally 6 feet 8 inches for the reception of the body.

Edward I. regarded Berwick-on-Tweed as the key to the northern kingdom, and not only reared its fortifications, but made the town the base of his military operations in his wars with Scotland. Shortly after the execution of Wallace, Robert Bruce, Earl of Carrick, raised the standard of rebellion on behalf of Scottish independence, and in March 1306 A.D. was crowned King of Scots. King Edward, on hearing the news, waxed full of fury, and solemnly vowed never to rest until he had thoroughly crushed the insurrection, and with a mighty army marched northwards to ravage Scotland with fire and sword; but at Burgh-by-Sands he died suddenly, within sight of the Cheviots, in July 1307. With his dying breath he solemnly charged Edward, his son, on pain of his curse, to carry his dead body in front of his army, and never rest until he had utterly crushed the Scottish rebels.

This dying covenant was not carried out, and the follow-

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ing year Edward I. was buried in Westminster Abbey, where his unfinished tomb is the plainest of the Royal tombs. It is composed of five slabs of grey marble, and bears the inscription, "Edwardus Primus Scottorum malleus hic est, 1308. Pactum serva." (Here lies Edward I., the hammer of the Scots, 1308. Keep covenant.) Dean Stanley thought it possible that the last words might have reference to the dying covenant he made with his son. The King was so tall that he was nicknamed Longshanks, and his long tomb in Westminster is the same length as that of the recently unearthed sarcophagus found by the Berwick Edwardian Walls.

A year elapsed between the King's death and permanent sepulchre in Westminster. Where was the body deposited meanwhile? Is it possible that Edward II. carried his father's body with him to his famed stronghold of Berwick-on-Tweed, and that the remains were deposited in this abnormally long sarcophagus, until the King, realising the impracticability of carrying out his dying father's command, determined to transfer the body to Westminster Abbey?

WINDSOR CASTLE.*

WINDSOR CASTLE is unique; there is no other place like it in England; here is fortress, palace, chapel, burial place, garrison, and formerly, but no longer in these happier times, prison. It is a storehouse of priceless treasures, in sculpture, pictures, armour, plate, and innumerable trophies. In addition to this, it carries us back to the past, and gives us a notion of the habitations of the monarchs of past generations.

This is not the first visit the Upper Norwood Athenæum has paid to Windsor Castle, and I do not propose to write an elaborate description either of the Castle itself or of its illustrious inhabitants, as accounts of both are already on the annals of our Society. I shall content myself therefore with a brief sketch of the history of the Castle, and more especially of the Order of the Garter with which it is so closely associated. The place is supposed to take its name from the bend of the river—"Winding Shore." Tradition says that there was a British stronghold here, and that it was here King Arthur instituted the first Order of Knighthood in England, namely, that of the Round Table, and Edward III. fostered this idea when he followed suit with his own Order of Chivalry. The first authentic account of Windsor is in the time of Edward the Confessor, who granted it to the monks of Westminster as part of the endowment of the famous Abbey. The ill-fated Harold, the last of our Saxon kings, also held possessions here. When William the Conqueror came he saw the military advantages of the lofty hill in the midst of the plain, and effected an exchange with the monks of the monastic lands, and confiscated those of Harold. He erected a castle, all traces of which have entirely disappeared. His son, Henry, enlarged and improved the castle and built a chapel, which he dedicated to Edward the Confessor, and which probably stood where the Memorial Chapel is now. He was married here in 1121 to his second wife, Adelicia of Louvaine, and there was a quarrel between the Archbishop of Canterbury and the Bishop of Salisbury as to who was to perform the ceremony. In the next year Henry obliged all the great officials, both clerical and lay, to swear allegiance to his daughter, the Empress Maude, and again there was an ecclesiastical dispute between the Archbishop of Canterbury and the Archbishop of York, which was determined in favour of the former.

Henry II. seems to have made the place a residence, and to have expended money in alterations. During the absence of Richard I., John seized the Castle and took it from its custodian, and he was in his turn shortly afterwards dispossessed. After his accession to the throne he was frequently in occupation, and he stayed here whilst Magna Charta was in course of negotiation, and went from here to Runnymede until the Charter was signed.

Henry III. rebuilt considerable portions of the Castle, and some of his work is still extant. The Curfew Tower, for instance, is said to be almost in the same state as when he built it, and it is also said that some portion of the wall of the present Memorial Chapel was erected by him.

Edward I. only resided here occasionally, but Edward II. and his Queen made it more of a residence, and it was here that their son, Edward III. (Edward of Windsor) was born. Windsor was always a favourite place with him, and it was he who raised it to its great position. He made great alterations and improvements, and, amongst other things, built the present Round Tower and several of the other towers. His architect was the celebrated William of Wykeham, the founder of Winchester College and New College, Oxford. Tradition says that on the Winchester Tower Wykeham put the inscription "Hoc Fecit Wykeham," which can be interpreted two ways. His enemies reported it to King Edward as an instance of his wish that posterity should recognise him as the builder instead of the King, and translated it "Wykeham made this." Wykeham, however, when taxed by the King, said the translation was altogether wrong, and it really meant "This made Wykeham," meaning that it was through his being employed as the King's architect that he was so far advanced in honour and position. Edward's most notable achievement, however, was the building of St. George's Chapel and the founding of the Order of the Garter. There is nothing of this chapel left now. Edward's good genius, Queen Philippa, died at Windsor. Her final farewell to Edward is most feelingly described by Froissart. Some alterations were made by Edward about the end of his reign, and the architect employed was the poet Geoffrey Chaucer. Windsor Castle was a prison as well as a palace; two kings were Edward's prisoners here at the same time—David, King of Scotland, and John, King of France.

Richard II. parted here from his child Queen, Isabella of France, when he himself went into captivity. Royalty married young in those days; she was only eleven years old at the time.

Henry IV., who supplanted him, resided at the Castle, and it was here that for many years he kept James, King of Scotland, as a prisoner. There is a very romantic story in connection with James's captivity; his window overlooked a garden, and he wrote a descriptive poem, of which I give the first verse:—

> Now there was made fast by the tower wall
> A garden fair, and in the corners set
> A herbere green, with wands so long and small
> Railed all about; and with trees close set
> Was all the place, and hawthorn hedges knit,
> That no one, though he were near walking by,
> Might there within scarce anyone espy.

The paradise was not without its Eve. One day he saw a most beautiful lady walking in the garden. Whether the lady walked in the garden because she knew the King was looking out of the window, I do not know; at all events, he fell in love with her—

> And therewith cast I down my eyes again,
> And walking, as I saw, beneath the tower
> Full secretly new coming her to pleyne (play)
> The fairest and the freshest youthful flower
> That e'er I saw, methought, before that hour,
> For which surprise so sudden, did astart
> The blood of all my body to my heart.
> And though I stood abased then a lyte (little)
> No wonder was, because my wits were all
> So overcome with pleasure and delight
> Only through letting of my eyes downfall,
> That suddenly my heart became her thrall,
> For ever, of free will, for of menace
> There was no token seen in her sweet face.

She was the King's niece, Joan Beaufort, and later on they were married at the present Cathedral Church of Southwark. King Henry V., as her dowry, took 10,000 marks off her husband's ransom.

Henry V. and his Queen resided here, and it was here that Henry VI. (Henry of Windsor) was born. Edward IV. made great improvements and alterations; he found the Chapel of St. George in a ruinous state and pulled it down and commenced to rebuild it, but the work was not completed at the time of his death; it was, however, taken in hand by that great builder, Henry VII., and we now have this as one of the finest examples of the architecture of that period; it is in the same style as his chapel at Westminster and King's College Chapel, Cambridge.

Edward IV. was the first king to be buried at Windsor. There was a most elaborate tomb erected for him, but for some reason it was never completed; there was, however, his surcoat richly embroidered and studded with jewels, his sword and helmet, which, however, were all taken away in the time of the Commonwealth. The next king to be buried there was Henry VI., whose body was brought from Chertsey Abbey. Windsor Castle was his birthplace, his palace, his prison, and his burial place.

Henry VIII. made Windsor his residence and built largely, amongst other things, the gateway which bears his name. His wife, Jane Seymour, was buried here, and he directed that he should be buried with her, and this was carried out. Their

* Read at a meeting of the Upper Norwood Athenæum by Mr. George Thatcher.

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grave is marked by a simple slab in the pavement of the choir, although Henry in his will left elaborate directions for the erection of a most splendid monument to himself and his Queen. This, however, was never carried out, and it is a curious irony of fate that the grave of the man who was the cause of the destruction of so many splendid monuments all over the country should be only distinguished in this homely and insignificant manner.

In his reign Cardinal Wolsey began the work of the present Memorial Chapel, intending it to be his own burial place, but at his disgrace the work, of course, was stopped.

Queen Elizabeth seems to have been the first to have originated the terraces, and she built the present Royal Library.

Charles I. resided here and intended to make improvements, but was never able to carry them out. After his execution his body was brought here and buried. His son, Charles II., however, built the grand staircase and a considerable portion of the present State apartments.

William III. also built here.

Queen Anne made Windsor Castle her principal residence, and made great improvements in the park and gardens.

The two first Georges do not seem to have troubled Windsor very much, but the place will always be connected with the memory of George III., whose favourite residence it was from the time when he went there with his Queen, a young man a little more than twenty, until the time of his death at the age of eighty-two. He was always fond of Windsor; even to the last, when sight and reason were both rapidly failing. The account of his last days is described by Thackeray in one of the most affecting pieces of English prose. He says that the Queen came upon the King in his little chamber; he was singing a hymn to his own accompaniment; when he had finished he knelt down and prayed for his country, for his wife and family, and that he himself might be spared the heavy affliction which he knew was brooding over him. He died at Windsor, and was buried with his wife and some of his sons and daughters.

The next monarch, George IV., made great and extensive alterations. He heightened the Round Tower and built the present St. George's Hall, the Waterloo Chamber and other of the State apartments, and also the gateway bearing his name. He died here in 1830, and seven years later, almost to the day, his brother, William IV., died in the same room. They are buried at Windsor, as is also the Princess Charlotte, the only child of George IV.

Windsor Castle was the favourite residence of our late beloved Queen and her husband, the Prince Consort, during their joint lifetime, and it was here that the latter died in December 1861. There is a splendid monument to him in the Memorial Chapel. The English people are only even now beginning to recognise how much they owe to this good and illustrious man who, by his counsel and support to our late Queen enabled her to purify and ennoble her Court, and, through them, the British nation. He was far in advance of his time, and through his encouragement, science, literature and art of every kind and description were fostered and helped.

Windsor is closely associated with the Order of the Garter, the highest and most chivalrous Order of Knighthood in the world. It owes its origin to Edward III., who is said to have conceived the first idea of it in 1344, when he invited a special gathering at Windsor of the most illustrious knights in Europe, but it was not until 1350 that it can be said that the Order was actually established. The Order was dedicated to four patrons, namely, the Holy Trinity, the Blessed Virgin Mary, St. George, and St. Edward the Confessor, but the badge is the badge of St. George, and it is with him the Order is always closely associated. Every country in Europe has its own patron saint, but up to the time of Edward, none was actually associated with England, and the selection of St. George is rather a curious one. There are several stories as to who St. George was, and why he was selected as England's patron saint. The old legend is that many years ago, in the Kingdom of Egypt, a great dragon took up his quarters in a lake in Sylene and made great havoc amongst the people and their flocks and herds, and to appease him, two sheep were given him every day; after a time there were no more sheep to be had, and then a boy or girl had to be substituted for the sheep; they were chosen by lot, and one day the lot fell on Princess Saba, the King's daughter. She was taken out and left for the dragon to devour, and whilst there a young knight in glittering armour rode by and asked why she was bound. She told him, and he then said that he would fight the dragon and kill him. She begged him to go away lest he also should be destroyed, but he remained. After a time the dragon came to fetch his prey, and a most terrific encounter ensued. St. George's lance was broken to shivers against the scales, but he drew his sword and thrust it down the dragon's throat, so that it was vanquished. St. George unbound the Princess and told her to bind her girdle round the dragon's neck and lead him back to the town. This she did, and St. George then exhorted the king and his people to be baptized as Christians, and accordingly the king and princess and 15,000 of his subjects were baptized then and there. The story told by Gibbon is that St. George was a native of Cappadocia, and was a contractor of provisions for the army and made a great fortune by selling them bad bacon. Ultimately he entered the priesthood and became Archbishop, but the heathen took the city and he was slain with others. The third and most authentic story is that in the time of Diocletian, emperor of Rome, there was a violent persecution of Christians, and the emperor had placards published forbidding the worship of Christ, and that anyone who was found doing so would be punished with death. One of these placards was exhibited outside the palace gates, and it had not been up two hours before it was torn down by a young captain of the emperor's own bodyguard. He was immediately seized and brought before the emperor. He was offered pardon and promotion if he would but put a pinch of incense in the fire before the altar of Apollo, but he refused, and was beheaded. It is said that he was only twenty-four years of age, that he was of noble birth, a most highly accomplished man, a brave and successful soldier, and had a brilliant future before him, and that the emperor would most willingly have spared his life if he had but made the slightest repudiation of Christianity. No particular glory, no dragon, no Princess Saba, and apparently no great conversions, but "the blood of the martyr is the seed of the Church," and the example so far from checking Christianity caused it to spread far and wide. St. George's emblem is a part of the flag of England to-day, the red cross of martyrdom crowning a spotless life. This was far more likely to be the saint that Edward would have chosen than the sordid bacon merchant. The first connection with England is that, at the time of the Crusades, the warriors of the different countries each bore a cross on their surcoats, and the symbol chosen by the English was a red cross on a white ground. It is said that in one of the battles with the Saracens, at which Richard I. was present, the Crusaders were being hardly pressed and suffering great loss; at the time of their sorest need, a young knight dashed to the front clothed with the white surcoat with the red cross, and mounted on a milk white steed; he rallied the Crusaders, and the Saracens were defeated with severe loss. After the victory he was nowhere to be found, and the chaplains declared that it must have been St. George himself. Richard I. and his Crusaders after that considered that they were under the special patronage of St. George, and invoked his aid in battle. It is said that after Edward had decided upon the institution of the Order, the battle of Crécy took place, and it was here for the first time that the war cry of St. George for England was used, and Edward is stated to have considered that he owed his victory to the special invocation to St. George; at all events, he adopted St. George as the patron saint of England, and practically as the patron saint of the new Order. There are several stories in connection with the choosing of the motto of the Order, one being that at a dance at Windsor Castle, the Countess of Salisbury dropped her garter, and Edward picking it up, caused some of the courtiers to smile. The King said to them, "Honi soit qui mal y pense," "Evil be to him who evil thinks of this," and this he adopted as the motto of the Garter. Some say that it was the Queen herself who dropped the garter, and the attendants not taking the trouble to pick it up, Edward did so, and he is also credited in both stories with saying "Contemptuous as you may think this, it is something that all the world shall honour." Edward, as we have seen, had got the idea that it was at Windsor that King Arthur had instituted the Order of the Knights of the Round Table, and he intended the Order of the Garter to be on the same basis. The Order was to consist of himself and twenty-four chosen Companions; their only qualifications were to be of gentle blood and knights, and to have distinguished themselves in some great achievement; no matter what their rank elsewhere, they were all equal in the Order, their robes and weapons were to be the same, and there was to be no distinction between them; they were to be brothers, and when a vacancy occurred the new knight was to take the vacant stall, no matter whether he or his predecessor were king or simple knight. There are only two exceptions, the Sovereign and the Prince of Wales. Originally the Order was restricted to the Sovereign, the Prince of Wales, and twenty-four Companions. There have been alterations from time to time, and now the Order consists

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of the Sovereign, the Prince of Wales, and twenty-five knights, and as additional members descendants of George I. are eligible; no knight below the rank of Earl can now be admitted. The Bishop of Winchester is always the Prelate, the Bishop of Oxford the Chancellor, and the Dean of Windsor the registrar. Ladies have been admitted to the rank of Lady Companion, and wore the Garter round their left arm.

Associated with the Garter was the institution of the Poor Knights, now known as the Military Knights, and selected from men who have served in the army and have fallen into decay, and it was formerly the privilege of each Companion of the Garter to nominate a poor knight. These gentlemen live in the Castle in the row of buildings opposite St. George's Chapel. For the original rules, customs and ordinances relating to the Order of the Garter and the list of the first knights, I would refer you to Elias Ashmole's book on the subject. He was a herald in the time of Charles II. and founder of the Ashmolean Museum. To the lovers of Conan Doyle's two best books, "Sir Nigel" and "The White Company," it is interesting to know that the hero, Sir Nigel Loring, was not a fictitious person, but was one of the first of the knights, and his coat of arms is still to be seen in the ninth stall from the east end. In the annals of the Order his Christian name is written Neile instead of Nigel.

His record is thus stated. Served in the wars in France under Edward the Black Prince, was one of the Council to King Edward, and one of the Plenipotentiaries for concluding a peace with France. He afterwards served in the wars in Spain, and was at the battle of Najara or Nazar. For his good services Edward the Black Prince granted him a pension of 50*l.* per annum for life. He died in Richard II.'s reign, and was buried in the Priory of Dunstable, where he had been a great benefactor.

THE LEANING TOWER AT PISA.

PROFESSOR WILLIAM H. GOODYEAR, curator of the Brooklyn Institute of Arts and Sciences, has made a personal investigation this spring of the credited increase of the inclination of the famous tower at Pisa, and his views, expressed in the following letters to a friend, will no doubt be of interest to our readers, and we therefore, by Professor Goodyear's permission, give them:—

July 22, 1910.—"I was in Pisa this spring before the report of the Commission appeared. Its authors were naturally reticent at that time and it was given out that they had nothing of importance to communicate. It could, however, be seen that water was coming up into the well-shaped construction which surrounds the tower, and it was apparent that such flow of water might very much weaken the surface under or near the foundations. This water appears to come from an old Roman aqueduct underground, as the tower and cathedral stand very near the site of the former palace of the Emperor Hadrian and of some Roman baths. It may be that the tower is now in danger, but as this danger appears to come from a recent cause, viz. that of an underground water-course which has taken a new direction, it does not at all follow that the present facts have anything to do with the original inclination. My previous measurements were supplemented this spring by measures in the spiral stairway, on each side of every step for the entire height of the tower. These measures are of remarkable interest as regards sequence and gradation, and I do not think they are compatible with the theory of accident. I have previously only taken measures at a few specially indicated points without knowing what the intervening gradations were.

"When I was in Pisa I was shown by the architect in charge of cathedral repairs, who is not a member of the Commission, in the garden of a house not far from the tower, remains of a Roman underground aqueduct which was full of water. It was the belief of this architect that the water now welling up in the tower was connected with the water in the aqueduct. The villa in whose garden the remains of the aqueduct are found is only 127 paces from the tower. It seemed to me very strange that the engineers of the Commission had not long since dug a trench at a sufficient distance from the tower and across the line which leads from this aqueduct to the tower, and that they have not conclusively ascertained whether the new source of weakness in the foundations is not due to the infiltration of water from this direction, in which case it would be very easy for them to turn the water in another direction and conduct it away from the foundations of the tower.

"I have not yet seen the report which has appeared, but a Milan newspaper has been sent me with communication from a correspondent in Pisa, which appears to give a very complete account of the report, and this account makes no mention of the probability that the infiltration of water comes from the Roman aqueduct, and, in fact, lays very little stress on this subject otherwise.

"The Milan report states that hitherto the only reliable measures of inclination were those taken in 1829 by the English architects Cresy and Taylor. The Milan report, based on interview with members of the Commission, goes on to say that in 1859 the leaning had been augmented by 13 cm., and that it has since 1859 been increased by 7 cm. It is difficult for me to understand how the Commission can know that the tower had leaned an increase of 13 cm. up to 1859 if the measures of Cresy and Taylor are the only ones to be considered, other authorities only having followed them. Moreover, if the tower had settled 13 cm. between 1829 and 1859, how is it we have to wait until 1910 to find out about it?

"There is one point about the report of the Commission which is of great interest, and they appear to lay stress on it, as showing the entire inclination to be accidental, but it appears to me to show nothing of the kind. The Commission has discovered, for the first time in history, that the foundations are tubular, and that they are confined to the surface under the tubular wall; in other words, that there are no foundations under the central open part of the tube. It seems to me to have been entirely sensible on the part of the original builders to have confined their foundations to the lines of direct pressure; foundations under the centre of the tower, where there is no weight, would evidently have been of not the slightest use. The Commission, however, lays great stress on this fact, and the Milan report states that the leaning of the tower is thus proved to be accidental, which seems to me absurd. Undoubtedly it is of great importance to know that Cresy and Taylor, and Rohault de Fleury, who followed them, have published pictures of foundations where none exist, but the conclusions drawn from their ignorance appear to me in this case unfounded. My own studies have revealed a great many other deficiencies in Cresy and Taylor's and Rohault de Fleury's surveys, which appear to me of a much more important character."

July 28, 1910.—"Having this morning received from a friend in Pisa, namely, the architect in charge of repairs to the cathedral (who is not a member of the Tower Commission), a copy of the *Courier*, of Tuscany, of July 14, I wish to add some points to those made in my previous letter. I mentioned in that letter that the report of the Commission was only known to me at second-hand, namely, the account given by a correspondent of the *Evening Courier*, of Milan. Some interviews given to reporters and the matter of my letter to you were founded on this account. The newspaper just received contains a complete verbatim report of the session of the committee held on July 6, one day before the appearance of the printed report. This authentic account of the session of July 6 probably corresponds exactly to the printed report, and it certainly contains all of its important matter in officially authenticated shape.

"The most important fact made known by this new source of information is that the depths of the masonry foundations (which are about 9 feet deep) are the same on both sides of the tower. In other words, the base of the foundation leans at the same angle as the base of the tower. This is held by the engineers to be a proof that the inclination is accidental. The fact does not appear to me to involve their conclusion.

"Supposing the builders to have constructed an intentionally leaning tower, it would have been most unwise of them to have made the foundations of unequal depth on the two sides. This would certainly have been an element of weakness, and especially so because its foundations would have been much shallower on the side of the exterior lean.

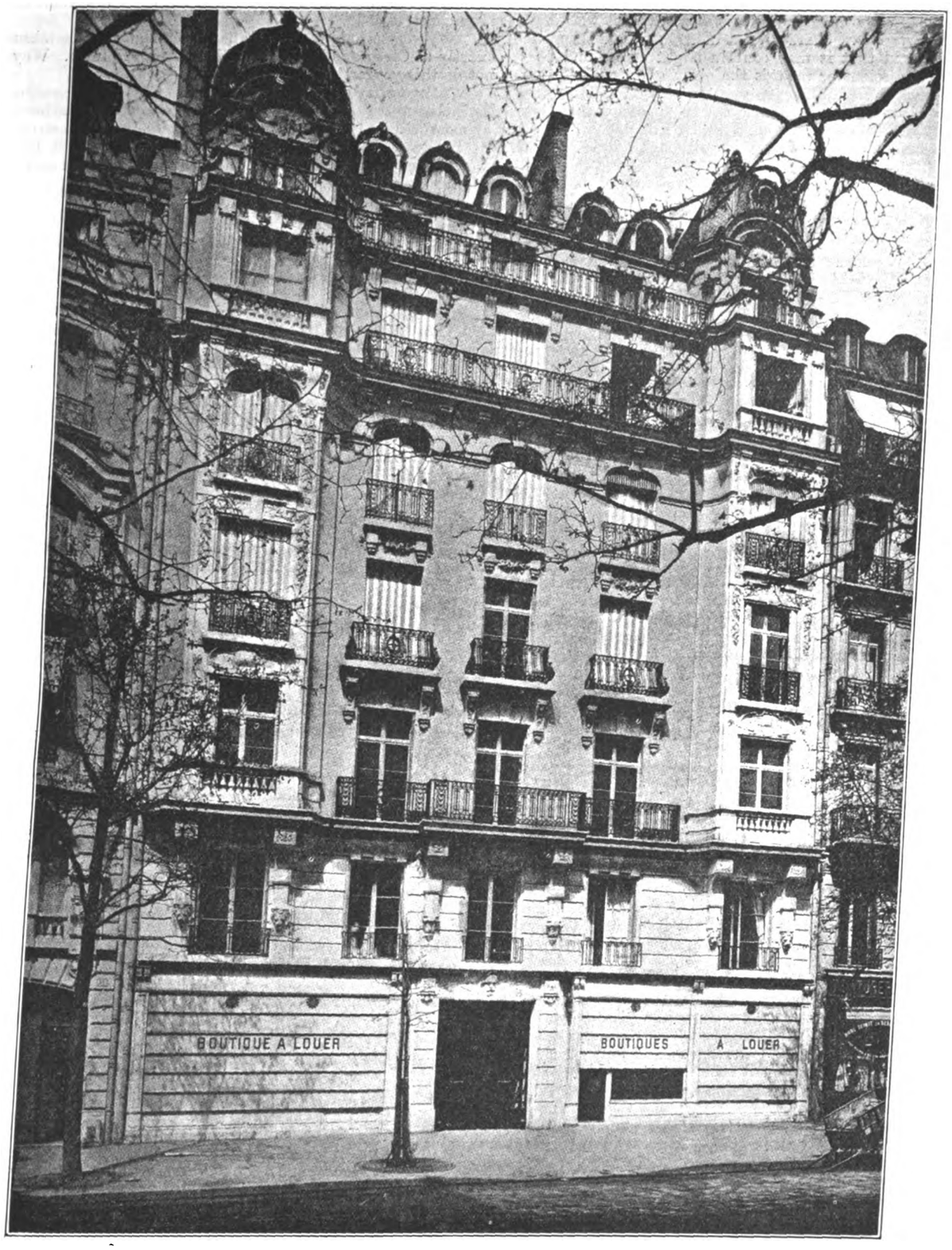
"The conclusion of the Commission, that of the 20 cm. additional lean since 1829, 13 cm. extra lean occurred before 1859 is expressed with great reserve and considerable doubt, as this conclusion would depend entirely on the reliability of de Fleury's surveys published in 1829, and the Commission does not seem to be convinced of the accuracy of this survey.

"At present the belief that the inclination has increased 20 cm. since 1829 rests entirely on the accuracy of the survey of Cresy and Taylor. This was no doubt a very accurate survey. However, a recent inclination, due to a special cause, such as the infiltration of water from an underground watercourse which had taken a new direction, has evidently no relation to the question as to the original lean. The conclusion of the Commission that the foundations ought to have been level at the base if the tower had been built to lean, appears to me premature and wholly improbable."

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MODERN EUROPEAN ARCHITECTURE.

FRANCE.



[From *La Construction Moderne.*

PREMIATED PARISIAN FACADE, 124 AVENUE VICTOR HUGO.—M. P. HUMBERT, Architect.

August 5, 1910.—"There are some questions raised by the report of the Commission on the Pisa Tower which raise a doubt in my mind as to their announcement of an increase of 20 centimetres in inclination since 1829.

"The verbatim report of the session of July 6, which was published in the *Corriere Toscano* of July 14, probably corresponds exactly to their report which was published separately on the date following the mentioned session, viz., July 7. The Commission states expressly that it has been unable to examine either the original designs or even the book of Cresy and Taylor, although it is expressly stated that the measures of Cresy and Taylor form the basis of their conclusion. In other words, the Commission did not take the trouble to send a member of the committee to the British Museum library to examine the original authority from which their conclusions are drawn, presuming that it has

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been unable to find a copy in some library nearer to Pisa. The Commission expressly states that it would have been desirable for them to have known this original work.

"It expressly states that their only knowledge of Cresy and Taylor's measurements is derived from a publication by Raniere Grassi in 1831 entitled "Le Principali Fabbriche di Pisa." The Commission expressly states that this work had essentially an artistic character (as distinct from a scientific character), and that it may contain slight errors and possibly some omissions as regards the given question. ("Con qualche lieve errore e forse con qualche omissione.")

"Please note now some reasons for my suspicion that they have been misled by Grassi's book, which I do not know, and which I cannot obtain in New York, although I have ordered it to be obtained as soon as possible.

"The book by Grassi, which I do know, which is in our library, and which I have frequently quoted as first mentioning the peculiar construction of the spiral stairway, dates 1837, and is entitled "Discrizione Storica e Artistica di Pisa." This book makes no reference to measurements by Cresy and Taylor. It gives no measurements for its very interesting and very important observations bearing on the question of intentional construction. It gives the measurements for the inclination, but does not state how or where they were taken. These measurements differ from those of Cresy and Taylor. They do not correspond to any which are mentioned by the Commission, and they differ as regards the internal and external inclination in a manner which is incomprehensible to me. In the book of 1837 Grassi states the internal inclination to be m. 3.404, and he states the external inclination to be m. 4.319. These two measurements differ m. 0.915, which is absolutely incomprehensible to me. Cresy and Taylor's measurements, as contrasted for the inside and outside, only differ three-quarters of an inch, or two centimetres. Cresy and Taylor's measure for the internal inclination is stated in text to be 12 feet 6¼ inches, which I figure in metres and centimetres as m. 3.82.

"Note first, that this does not correspond to either of Grassi's measurements as given in 1837.

"Note second, that Cresy and Taylor describe the exact manner in which this measurement was taken.

"'The inclination of this tower is in the direction of the lean C.B. plan, plate 22. In order to clear the projecting course intended as the springing of the vault of the ground floor it was necessary to attach the plumb line 2¼ inches from the centre or north of what should have been the top of its real axis. . . . This spot is marked "A" on the plan of the eighth storey, 13 feet ½ inch from the inner face of the wall on the lowest side, and 12 feet 8 inches on the other. So attached the bob fell 3½ inches within the window of the ground floor, marked "B" in plate 22; 12 feet 4 inches from the real, 12 feet 6¼ inches from the assumed axis, the 2¼ inches being added for the deviation in attaching the line at the summit.'

"In other words, when Cresy and Taylor took their measure the plumb bob rested on the ledge of a window which is now over 7½ feet above the level of the interior floor of the tower, and more than 7½ feet above the level of the present exterior visible foundations, viz., the plinth courses. Their drawings not only indicate the plumb bob as resting on the window ledge, but the exterior drawing shows that the exterior measurement stopped at the same height above the plinth course. Both drawings indicate a filling in of débris or rubbish which prevented observations lower down, and it is otherwise probable that it was not until 1839 that it would have been possible to make observations lower down.

"Note in the next place that the Commission does not report any measurements for total lean, either as taken in 1910 or as published in 1829. The only total measurement which it furnishes is one between the first and seventh orders, stopping therefore at the first cornice. These measurements are otherwise stated in millimetres per metre, and they are stated in this way. The inclination per metre as stated in millimetres in 1829 was m. 0.086½; in 1910 it was m. 0.092.

"Now come back to the fact that Cresy and Taylor's plumb, both inside and outside, stopped 7½ feet above the present level for correct plumbing. The lean in 7½ feet at the rate of 86½ millimetres would be 3 millimetres short of 20 centimetres. Now 20 centimetres is the amount of additional inclination which the Commission believes has taken place.

"Query—was one of the 'slight errors or omissions' of Grassi's, in his book of 1831, omission of the fact that the plumb was 7½ feet short of the length of line which is necessary to-day?

"Another point which causes doubt is the indisposition of the committee to give credence to Rohault de Fleury's measurements of 1859, which appear to me to have been more carefully made than Cresy and Taylor's. If Fleury's measurements are correct they might be held to show that Cresy and Taylor had made a mistake of 13 centimetres, instead of showing as the Commission holds that the tower had moved 13 centimetres.

"In that case the entire movement would only be 7 centimetres, supposing that de Fleury had not made a mistake of 7 centimetres.

"My very strong feeling is that a plumb should be taken exactly as Cresy and Taylor took their interior plumb. Why not do this yourself?

"All you have to do is to drop a line through the grating 2¼ inches north of the centre of the seventh storey platform, as measured by Cresy and Taylor, and note if the bob strikes 3½ inches inside the window ledge. Your permit at Pisa would come from Bellini Pietri, director of the Civic Museum. Mention my name, if you think best."

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

The Proposed Coinage.

Sir,—Respecting the illustration of the medal of John, Duke of Argyll and Greenwich, which was referred to in my paper printed in *The Architect* on the 5th inst., I would suggest to the Mint authorities that it would make an excellent design for the proposed coinage, instead of the decapitated head shown on all the coins of our late revered monarch, King Edward VII.

Of course, we all know there were precedents for the neck *coupé*, which were very prevalent in the old Roman coins. But for such men as Nero, who were fond of decapitating others, perhaps it was in the order of things that they should be



represented that way on their coins. In these more civilised times it makes one shudder to see so amiable a monarch as Edward VII. represented that way. The coin should look as though you see a portrait in a looking-glass or painted on canvas, so as to show part of the costume of the period, as in our Tudor coins. We should not recognise Queen Elizabeth, for instance, without her well-known collar. Some of the coins of Queen Victoria show her with a decapitated head, and others with the upper part of her dress. I submit the latter are far more preferable.—Yours very truly,

W. F. Potter.

18 York Grove, Queen's Road, Hatcham, S.E.

The Indo-European Trading Society, Ltd.

Sir,—We are preparing for publication in India a directory of manufacturers of goods and machinery in this country suitable for the Indian markets. To enable us to make the information as complete as possible we shall be glad if you would, through the medium of your columns, invite manufacturers in your trade who are (or are likely to be) interested in the Indian markets to forward us particulars of goods, &c., manufactured by them.

Communications should be addressed to Publicity Manager, the Indo-European Trading Society, Ltd., 4 Maddox Street, Regent Street, W.—Yours truly,

For the Indo-European Trading Society, Ltd.,
Lewis O'Connor, Manager.

London: August 9, 1910.

Her Majesty the Queen has been pleased to accept a large copy of Mr. Edmund Sedding's "Norman Architecture in Cornwall," and has written to the author in acknowledgment, showing that Her Majesty retains her interest in the old buildings and history of the county. A smaller edition, containing the same illustrations and information as in the large edition, has now been published.

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The Architect.

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FORTHCOMING EVENTS.

Thursday, September 1.

Society of Architects : Council Meeting. House List 1910-11.

Monday, September 5.

Royal Sanitary Congress : Twenty-fifth Congress opens at Brighton.

THE A.A. ANNUAL EXCURSION.—III.

THURSDAY marked an epoch in the history of A.A. excursions, for on that day for the first time the members rode forth in a motor vehicle, a novel method of travel which possesses many advantages, and was on the first trial voted a decided improvement.

The first halt was made at Arthington Nunnery, where a convent of Cluniac nuns was founded in the twelfth century by PIERS DE ARDINGTON, which was valued at the Dissolution at 19*l.*; the site is occupied by a farm-house, now called the "Nunnery," which, bearing date 1585, was clearly built after the Dissolution. It is a charming piece of unaffected design, with a plethora of mullioned windows, divided into bays by a double order of deeply recessed mullions or piers. Interest and piquancy is given to the front by an oriel window over the entrance, which is not central in the elevation.

Internally there is not a great deal of interest, save in the room now used as a drawing-room, which has simple panelled walls and good plaster work on the ceiling.

From Arthington a short ride brought the excursionists to Harewood, where the rest of the day was spent in the study of the castle, the church, and the mansion. The castle, dismantled between 1630 and 1657, and now in ruins, is supposed to have been built by Sir WILLIAM DE ALDBURGH, who, in 1367, received licence to crenellate the manor house of Harewood, and whose coat and motto, "Vat sal be sal," are to be seen on the entrance tower. The plan is interesting as showing how a fortified house of the latter part of the fourteenth century differed from the earlier type. There are several bits of good Decorated detail, notably a permanent buffet, or sideboard, designed something like a recessed wall tomb with canopy.

The church of All Saints, Harewood, is a good Perpendicular design erected upon the site of an edifice supposed to have been built soon after the Conquest. The nave arcade is remarkable for the absence of imposts or caps to the piers on to which the arch mouldings die, the label termination being carried on small corbels.

The most notable feature of the church is, however, the collection of monuments, mostly of alabaster. This includes those of Sir RICHARD REDMAYN and his wife, the daughter and co-heiress of Sir WILLIAM GASCOIGNE, the famous Chief Justice; of Sir WILLIAM himself and his wife; of Sir JOHN NEVILL, who died 1482, and his wife, whose daughter married Sir WILLIAM GASCOIGNE; of Sir RICHARD FRANKS and wife; of Sir WILLIAM RYTHER and his wife SIBYL, daughter and co-heiress of Sir WILLIAM ALDBURGH.

The mansion was built by HENRY LASCELLES, first Baron Harewood, in 1760, at a cost exceeding, it is said, 100,000*l.*, from the designs of JOHN CARR. A water-colour drawing, said to be by TURNER, preserved in the hall, shows the house as it originally stood. Another water colour by J. VARLEY, 1803, indicates that it had then been altered, whilst drawings by Sir CHARLES BARRY, made in 1843, which were exhibited to the members, show it as then "proposed to be altered." BARRY'S proposals were not carried out in their entirety, but in part, and the west wing has been rebuilt after its partial destruction by fire in 1885. Thus the house, although in the main the design of JOHN CARR, does not to-day stand exactly as he left it.

On the ground floor are several fine and stately rooms, with ceilings elaborately decorated in plaster, colour and picture paintings. The long gallery is a splendid room, 77 feet by 24 feet, and contains many fine pictures, including works of HOPPNER and REYNOLDS, and a rich collection of china valued at 100,000*l.* The rooms on the upper floor are poor by comparison and scarcely worthy of the size of the house or the magnificence of its state rooms on the ground floor. The grounds and gardens were originally laid out by "Capability" BROWN, but have been much altered since his time. As at Temple Newsam, the stonework of the house and the foliage of the trees are said to be suffering from the smoke of Leeds. The entrance to the park of Harewood is a good piece of scenic design by JOHN CARR, with a Roman Doric triumphal arch in the centre and semi-circular fence walls and railings terminated by two well-designed lodges. The village was laid out and some of the houses were designed by CARR. After a full day at Harewood, the return to Harrogate was made by motor-car.

Friday morning, for the first time in the week, opened with unpleasant weather, rain making the prospect of a motor-car ride sufficiently unpleasant to warrant the secretaries in delaying the start for an hour. When the rain had cleared and the delayed start was made, the disadvantages of the motor-car experiment were revealed, for after sundry attempts at jibbing had been overcome the car finally struck work and a fresh one had to be procured. With this, however, a pleasant ride brought the excursionists to the beautiful valley of the Skell, where Fountains Hall and Abbey were visited and studied.

The abbey of the Cistercian Order was founded in 1132 for thirteen Benedictine monks of St. Mary's, near York, who, leaving their home with the design of observing a more strict and reformed rule, obtained from THURSTAN, Archbishop of York, a grant of land sufficient for their purpose. It was dedicated to the honour of the BLESSED VIRGIN, and was endowed with great revenues said to be worth at the Dissolution 1,173*l.* 0*s.* 7*d.* The abbey was situated in a valley environed by well-wooded hills, on the banks of a small stream called the Skell; the ruins, occupying an area of about two acres, are probably the most extensive and interesting monastic remains in the kingdom, principally dating from the Late Norman and Early English periods, and consist of the church, with its lofty tower of Perpendicular date, two cloisters, the chapter-house, refectory, dormitory and kitchen, besides the appendages of the gate, the mill and the bridge.

Fountains Hall carries most of its architectural interest on its front which, whilst symmetrical in disposition, is quite picturesque in composition, with its central oriel window set back behind a projecting ground floor and flanking towers at the ends of the façade. Internally the house has been much modified and spoilt, but

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the banqueting-room on the first floor still retains its elaborate stone chimney-piece with sculptured representation of the Judgment of Solomon and in the windows of the oriel is a fine collection of armorial glass.

After an enjoyable day at Fountains, rendered the more delightful by brilliant sunshine which had succeeded to the early morning's dampness, the excursionists proceeded to Markenfield Hall, a remarkable example of a moated house of the time of Edward III. The hall, chapel, and solar of the original house are on the first floor and still retain their windows and other architectural details of Early Decorated character, so that the plan, with the exception of the original external staircase, remains clearly recognisable. Externally the house is exceedingly picturesque with its early Edwardian main block on one side of the great quadrangle, formed by later additions and surrounded by the moat.

On the return journey to Harrogate a halt was made at Ripley, where the church and castle were visited. The castle, the seat of the Ingilbys was erected in 1555, but has been much modernised so that its architectural interest is small. The gardens, however, are remarkable for the beauty of their contents, though scarcely for their disposition, whilst the glass-houses are notable for their extent as well as for their contents. There is a charming view toward the west from the grounds with a lake and woodland scenery.

The church is interesting for the design of the western tower, which gains considerable effect from the boldness of its staircase turret.

The church contains some handsome monuments of the Ingilby family, among which is one to the memory of Sir Thomas de Ingilby, Justice of the Common Pleas in the time of Edward III., and on the north side of the churchyard there is a curious pedestal of an ancient cross, with eight niches apparently intended for kneeling, which is called the Weeping Cross, from a tradition that it was used by mourners after funerals.

Ripley concluded the official programme of the excursion, and the usual Friday evening proceedings were dispensed with as the intensely frigid respectability of the hotel that formed the headquarters discouraged any attempts at frivolity. An informal discussion of the locality for next year's excursion and the formal election of the committee made up the total of the last night's performance.

On Saturday about half the members went to Ilkley and visited there the house and church designed by Mr. Norman Shaw, and the residence of Mr. Hemingway, recently erected from the designs of Mr. E. L. Lutyens.

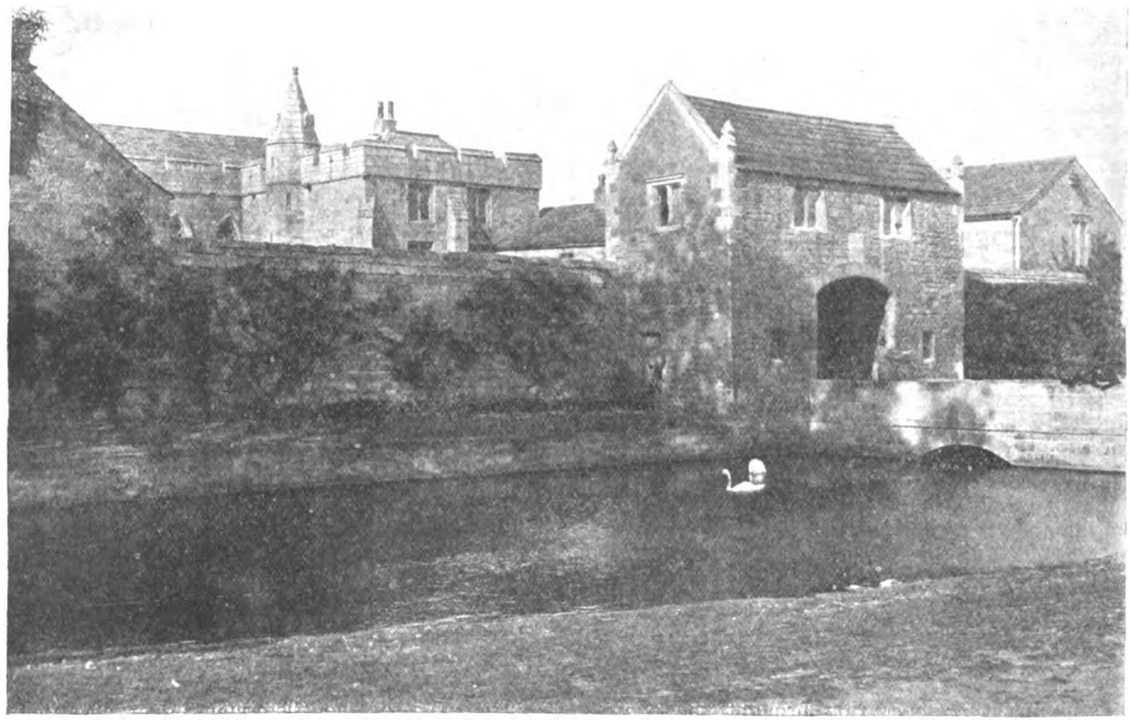
"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

SOME interesting drawings have been contributed for the July subject—a mediæval porch.

"Loidis" has measured the south porch of St. Peter's Church, Howden, Yorkshire, and the work is carefully measured and the detail of the development of the vaulting well worked out. The scale adopted is rather small for the subject, and in particular the details of the mouldings are too small. Gothic mouldings should be drawn to full size when possible, or at least one-third, as otherwise the correct feeling is difficult of expression. The drawings submitted by "Loidis" are well executed, and the carving in particular nicely drawn.

"Bradford's" subject is the doorway of the south porch of St. Mary's Church, Beverley, which is well drawn with full size sections of mouldings. A pleasing effect is obtained by a slight accidental shading of the stones, and the sheet is made more interesting by a perspective sketch of the whole church, showing the relation of the work measured to its environment. Backlining, though here used quite in moderation, should always be avoided in measured drawings, as the false and meretricious effect is only obtained at the cost of falsity of the delineation. No figured dimensions are given, which it is always advisable to include in drawings of measured work.

Mr. Marshall E. Walker has selected for representation the south porch of Woolpit Church, near Bury St. Edmunds, Suffolk, a large and elaborate building with parvise, of which Mr. Walker gives plans and elevation of the front and of the sides of buttresses. Sections of parts only are given, but to show the design completely numerous sectional plans at different heights are necessary, particularly to indicate the arrangement of the three central niches and two larger side ones in relation to the



MARKENFIELD HALL.

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general lines of the design. No dimensions are given, and the plan only of the vaulting, neither are there any full size sections of mouldings. The joints have been carefully measured, and a good scale, ¾ inch to a foot, adopted, but though the work that has been done is good, there is not enough of it for the proper representation of the elaborate character of the subject selected.

"Sans Peur" has chosen a beautiful example of a Decorated porch with parvise over on the south side of Leverington Church, Cambridgeshire, which, although restored in 1888 by Mr. J. L. Pearson, is well worthy of study, and has been carefully measured and well drawn with the jointing shown. An interesting point in this example is the use of stone principals carrying a slab roof over the parvise chamber.

Miss Victoria Williamson sends a practical and clear set of drawings of the south porch of Croydon parish church, Surrey, which again is an example with a parvise chamber. The porch is vaulted and the parvise has a lead roof. Plans of ground floor and parvise are given with a plan of the vaulting to the porch, but the jointing of this is not shown, and in the elevations the jointing of the masonry is not continued through the moulded work and tracery, which should always be done as it is an important feature of the constructional design of mediæval work. The scale used is more usually described as ¾ inch to a foot than one-sixteenth (full size), which, as we have already noted, is a good one for this class of subject.

"Balgownie's" subject this month is the porch of the Old Machar Cathedral, in Old Aberdeen, a gabled structure with corbie steps. The jointing of the masonry, including the paving, is fully shown, and, we hope, correctly, as, if so, this is an interesting example of the use of keystones to pointed arches, a practice which is bad construction and rarely found in good English Gothic, though not uncommon on the Continent. It is curious to note that, as an antithesis, "Balgownie" shows a central joint to a three-centred or elliptical arch. The mouldings are given on an undesirably small scale.

We have awarded the prize for July to "Sans Peur."

NOTES AND COMMENTS.

Whilst the Lord Mayor of London is engaged in strengthening numerically and representatively his committee for dealing with the question of an intended memorial to King Edward VII., suggestions are pouring in from all sides as to the form that the memorial should take.

These suggestions include, beside those we have already noted, an opera house in Trafalgar Square, an Indian museum on the southern embankment of the Thames, a new bridge across the Thames, the rebuilding of the Mansion House, a new model garden city, a statue of King Edward in the Mall, a pantheon or a memorial chapel to Westminster Abbey, a hall in Kingsway, and several proposals for assistance to hospitals or other philanthropic institutions.

A trenchant indictment of the Government attitude towards art has been made in the *Times* by Mr. W. Robert Colton, A.R.A., who points out that greater encouragement is given to the production of artists than to the provision of the means of livelihood for the artists whom it yearly turns out in increasing numbers. Another point to which exception is taken is the enlargement of our great national museums by the addition of works valuable for their rarity rather than necessarily for their beauty, instead of the establishment of local museums suited to the trade of each particular district, in which a limited number of well chosen examples should establish a criterion of taste.

A further valuable suggestion is that the Government collections should not be limited to instances of the art of antiquity, but that, following the example of the French Government, the work of present day artists in all crafts should be purchased and preserved for the instruction and appreciation of the general public as well as for the encouragement and support of the producers.

Whilst it is gratifying to hear that efforts are to be made to show the pluck on which we pride ourselves as a characteristic of the British by the reconstitution of the British section at the Brussels International Exhibition, we trust that the lesson may be also learnt of the necessity of adequate provision for fire protection in such exhibitions, and we are glad to be reminded by Mr. Watson Smith of the success that attended proper precautions in the Royal Jubilee Exhibition of 1887, held in Manchester, where, although numerous outbreaks of fire occurred, these were suppressed with scarcely an indication to the general public of their occurrence.

The offer of Mr. W. Banks to defray the expense of carrying out Sir Gilbert Scott's design for the crowning of the Old Steeple at Dundee is exciting a considerable amount of discussion. Some do not want any alteration made to the tower as it is, others want something different to Sir Gilbert Scott's design, and in particular Mr. J. C. Hay has made a design in two diminishing further storeys to the tower, which he claims is more probably like the original builder's intention than the arched crown suggested by Sir Gilbert Scott. It is good to find so much interest taken by the public of Dundee in an architectural question.

Very different is the report that comes from the Devonshire village of Stockleigh English, where the ancient carved oak roof has just been pulled down to make way for a brand new pitch pine concern. The old carving seems to have been typical Devonshire work, full of vigour and humour. Is there no one in Stockleigh English who knows or cares sufficient about the merits of Devonshire carving to have spoken in time to raise public opinion in defence of the condemned roof?

Aberdeen, like other places, means to have its own local memorial to King Edward VII., and to have it executed in the local material, granite, in opposition to the architects, artists, and University representatives, who supported the claims of bronze. Mr. Alfred Drury is to be entrusted with the work, and will thus have an interesting problem before him—to design a modern statuesque memorial in granite. The problem, not free from difficulty, offers an opportunity for either remarkable success or egregious failure.

In spite of the attacks of electricity and petrol, coal-gas is not yet dead as an illuminant, and the endowment as a memorial to the late Sir George Livesey of a department of Fuel and Metallurgy, with Gas Engineering, in the University of Leeds may assist in still further maintaining the use of coal-gas for lighting purposes as well as for its increased employment for heating, in which direction it is likely to become one of the most potent agents in the abatement of the smoke nuisance, particularly with regard to domestic heating.

An interesting announcement is that which appears in the French journals *Illustration* and the *Journal des Débats*, that M. Lucien Magne, Government Inspector-General of Historical Monuments, has recently discovered in the Abbey of Fontevrault the tombs of the Plantagenets, Richard Cœur-de-Lion, Queen Eleanor, Henry II., and Isabella of Angouleme. There is a possibility that these tombs may be removed from their obscurity to a place of honour at the entrance of the choir.

The Local Government Board has issued an important report by Dr. L. W. Darra Mair on the relative mortality in through and back-to-back houses in the towns of the West Riding of Yorkshire. The investigation by Dr. Mair has been extended to thirteen indus-

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trial towns, and the vital statistics have been taken for a period extending over ten years, so that a fair and unbiassed conclusion might be reached. The conclusion is that the mortality in back-to-back houses is 15 to 20 per cent. in excess of that in through houses, the lesser figures occurring when the back-to-back houses are built in blocks of four only, with an adequate air space between, rather than in terraces.

COMPETITION FOR LAYING-OUT BLACKLEY ESTATE, MANCHESTER.

AN interesting but by no means easy problem in town-planning is presented by the conditions of this competition. The estate is of very irregular shape and is rendered difficult of straightforward development by the inclusion of several areas, themselves of irregular form and varying extent, already appropriated for allotments. Several roads have been laid out in the usual stereotyped fashion, and a number of cottages have been erected. Further, a considerable area in the heart of the estate does not come within the scope of the competition.

Thus the problem bristles with difficulties and will require a great deal of careful thought before a plan can be produced that will satisfy the theoretical requirements of the ideal garden city or suburb as now generally recognised in this country.

The competition is for the premiums only that are offered, first 150*l.*, second 100*l.*, and third 50*l.*, since "it is not intended to engage the author of any design in carrying out the work."

The awards will be made by a jury of three assessors, one of whom will be appointed by the Corporation of the city of Manchester, after consultation with the President of the Royal Institute of British Architects, and the other two will be the City Surveyor and the City Architect.

Competitors will be supplied with a plan of the estate to the Ordnance scale of 25.344 inches to one mile, and will have to send in their plan of the laying-out to the same scale with longitudinal sections of all streets to this scale horizontally and one-eighth inch to one foot vertically. Typical transverse sections of the streets to one-eighth scale must also be furnished by competitors.

The cottages on the estate "are in the main to be semi-detached, not more than twenty to the acre, and each cottage must be provided with a bath and with two or three bedrooms," but designs for the cottages are not asked for. "Recreation-ground, bowling-green, tennis-courts, and children's playground must be provided, and sites for schools, library, laundry, reading-room and club, churches and chapels are to be indicated on the block plan."

"No estimate of the proposed outlay has been arrived at by the Corporation." The question of cost is, therefore, left to competitors, but "shall be a material element in the consideration of the assessors' award."

Designs are to be sent in not later than noon on December 1 next, and they will be adjudicated on and premiums paid within three months of that date. All designs will be exhibited, with the names of the authors attached, unless they specially object.

A good point in the conditions is that "the assessors, or any employé of either of them or of the Corporation, are ineligible to enter the competition."

THE ROYAL SANITARY INSTITUTE.

THE Royal Sanitary Institute preliminary programme of the twenty-fifth Congress, to be held in Brighton from September 5 to 10, has now been issued. The president of the Congress is the Hon. Sir John A. Cockburn, K.C.M.G., M.D.

Excursions to places of interest in connection with sanitation, conversazione, garden party, visits to Arundel Castle and the Isle of Wight, and other entertainments will be arranged for those attending the Congress.

There are over 200 authorities, including many County Councils and county boroughs, who have already appointed delegates to the Congress, and as there are also over 3,800 members and associates in the Institute there will probably be a large attendance in addition to the local members of the Congress.

In connection with the Congress a health exhibition of apparatus and appliances relating to health and domestic use will be held as practical illustration of the application and carrying out of the principles and methods discussed at the meetings; it not only serves this purpose, but also an important one in diffusing sanitary knowledge among a large class who do not attend the other meetings of the Congress.

The Congress will include general addresses and lectures. Two section meetings for two days each, dealing with:—Section I.—Sanitary Science and Preventive Medicine. President, Professor E. W. Hope, M.D., D.Sc., medical officer of health, City and Port of Liverpool. Section II.—Engineering and Architecture. President, Henry Rofe, M.I.C.E., F.G.S.

There will be the following eight special conferences:—"Municipal Representatives," presided over by the Worshipful the Mayor of Brighton (Councillor Edward Geere); "Port Sanitary Authorities," presided over by William H. Williamson, chairman, Port of London Sanitary Authority; "Medical Officers of Health," presided over by Edward Sergeant, L.S.Sc., L.R.C.P., M.R.C.S., medical officer of health, Lancashire County Council; "Engineers and Surveyors to County and other Sanitary Authorities," presided over by P. H. Palmer, M.I.C.E., borough engineer, Hastings; "Veterinary Inspectors," presided over by W. Hunting, F.R.C.V.S.; "Sanitary Inspectors," presided over by W. G. Cooper, chief sanitary inspector, Bournemouth; "Women on Hygiene," presided over by the Countess of Chichester; and "Hygiene of Childhood," presided over by Sir William J. Collins, M.P., D.L., J.P., M.D., F.R.C.S.

The local arrangements are in the hands of an influential local committee, presided over by the Worshipful the Mayor (Councillor Edward Geere), with Duncan Forbes, B.Sc., M.D., D.P.H., as local hon. secretary.

Appended is a list of the set subjects arranged for discussion. In addition a large number of papers on other subjects will be brought forward for discussion.

The full list of titles of papers on other subjects and the names of the authors will be given in the daily programme published during the meeting.

Section I.—Sanitary Science and Preventive Medicine.

"Carrier Cases of Infection from the Administration Standpoint," to be introduced by D. S. Davies, M.D., D.P.H., M.R.C.S., M.O.H., Bristol.

"Cleansing and Disinfection of School Premises," to be introduced by D. A. Carruthers, M.D., D.P.H., County Education medical officer, Bucks.

Section II.—Engineering and Architecture.

"Influence on Health of the various Levels in Sub-Soil Waters," to be introduced by Baldwin Latham, M.I.C.E.

"School Planning."

Conference of Municipal Representatives.

"Notification of Births Act, and the Organising of Schools for Mothers," to be introduced by John F. J. Sykes, D.Sc., M.D., medical officer of health, St. Pancras.

"The Training of Midwives in the Provinces," to be introduced by F. E. Fremantle, M.A., M.B., county medical officer, Hertfordshire C.C.

"Municipal Sanatoria for Phthisis," to be introduced by Duncan Forbes, B.Sc., M.D., D.P.H., medical officer of health, Brighton.

Conference of Port Sanitary Authorities.

"Disinfection of Ships in Relation to Plague, Yellow Fever and Cholera," to be introduced by Herbert Williams, M.D., D.P.H., M.O.H., Port of London.

"The Working of the Regulations made under the Public Health (Regulations as to Food) Act, 1907," to be introduced by E. W. Hope, D.Sc., M.D., M.O.H., City and Port of Liverpool.

Conference of Medical Officers of Health.

"Housing and Town Planning Act," to be introduced by F. E. Fremantle, M.A., M.B., county medical officer, Hertfordshire C.C.

"The Necessity for Registration of Schools not controlled by the Board of Education," to be introduced by A. Wellesley Harris, M.R.C.S., D.P.H., M.O.H., Lewisham.

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Conference of Engineers and Surveyors.

"Housing and Town Planning Act," to be introduced by Alderman W. Thompson, J.P.

"The Sewage Question and Treatment of Trade Effluents," to be introduced by John D. Watson, M.I.C.E., engineer, Birmingham, Tame and Rea Drainage Board.

"Collection and Disposal of House and Trade Refuse," to be introduced by H. Thomson Lyon (late chairman Highways Committee, City of Westminster).

Conference of Veterinary Inspectors.

"Scarlet Fever and Diphtheria: their Transmission from Animals to Man," to be introduced by W. Hunting, F.R.C.V.S.

Conference of Sanitary Inspectors.

"The Sanitary Inspector: his statutory position and duties."

"The Manufacture, Storage and Distribution of Foodstuffs for Human Consumption."

"The Evolution of the Sanitary Inspector as an Agent of the State in the Advancement of Public Health and Sanitary Science."

Conference of Women on Hygiene.

"Care of Infants"; "Practical Hygiene in the Home."

Conference on the Hygiene of Childhood.

"The Feeble-minded Child," to be introduced by A. F. Tredgold, M.R.C.S., L.R.C.P.

THE SECOND TOWN-PLANNING EXHIBITION IN GERMANY.

NOT only in the erection of houses but in the laying out of whole cities or town-planning, modern methods are being employed nowadays, and there can be observed a popular movement towards a remodelling of existing towns. This is proven by practical examples, by literature and even by exhibitions. In these three directions the German Empire is in advance of any other, and it was at Dresden that, in 1903, the first exhibition of city-building or town-planning was held, which this summer has been followed by another in the German capital. The latter has just closed, after having been kept open two weeks longer than was at first provided for. There were numerous requests from other communities to transfer the fine show to them, which, however, had to be refused, except in the case of Düsseldorf, Antwerp and London.

The "social question" was the characteristic problem of the last century, and we may consider as a fruit of this the study of the art of city-planning which has been taken up more or less enthusiastically in practically every cultured nation. The most important and difficult problem of this art is the big city, and the Berlin show was chiefly devoted to its conditions, demands, &c. Everywhere there is a need for increasing transportation facilities, for avoiding dense population in the residential portions, for bringing these nearer to nature in order to awake love for the home and the Fatherland. Such a work should, then, be crowned by the examples of great, popular art. For most large cities we can predict an immense development, and it is high time to break with obsolete methods. Density in habitation is probably the chief evil, and political questions concerning building ground will be for the near future the principal feature of municipal politics. To live in one's own single house, even if in the modest form of a simple cottage, is the desire of hundreds of thousands, and for this end we require much space outside the city border, and, as a result, excellent facilities of transportation. Such an exposition as that lately held at Berlin is a magnificent means for waking up the public as well as the authorities, and the placing of good German examples beside the best foreign achievements calls for a comparison. Every thinking person must be made more or less interested, and this is necessary to render the public well disposed for the really great sacrifices that improved town-planning demands.

In the matter of density Berlin surpasses, with the exception of Paris, that of other large communities, and public sentiment and the Press called for checking the evil before it is too late. Accordingly the procedure was followed that is so common in Germany of obtaining plans for a remodelling of Berlin by promoting a public competition. This was in 1909, and for a whole year the very best architects, artists and city experts were busy, and produced really wonderful projects. These numerous plans, sketches and models were the centre of attraction of the Berlin exposition, not only for the 4,000,000 people of Greater Berlin whose welfare is more or less dependent on them, but also for thousands of other visitors, among them many foreigners, as the projects can more or less be applied to other communities. 165,000 marks were expended by the communities for the competition alone, and 30,000 marks had to be provided as a guarantee fund for the exhibition.

Through centuries the idea was fixed in the public mind that cities were a "necessary evil," but that the majority of the inhabitants of the nation was not affected. In Prussia, for instance, only 10 per cent. lived in cities at the beginning of the last century. Consequently most people resided in the open country and did not feel the evils of city life, especially those from the hygienic standpoint. Cities were regarded as destroyers of the public health and force. When a family removed from the country to a town in order to follow their occupation in any industry, it was predicted that they would die out after three generations for want of air and light. At one time this was so. To-day half of the German nation lives in towns and one-third in large cities. But they are not lost, and there are signs that this immigration from the country to the towns will continue, until two-thirds of the nation will live in cities. Consequently, the welfare of the person residing in a city is almost identical with that of the nation, and this is also more or less the case in other countries. This is not the place to speak carpingly of the mistakes made in the past decades, for it is more useful to improve and correct them, whilst we preserve what has been done well. We must now carry out our new plans in such a way that they answer the



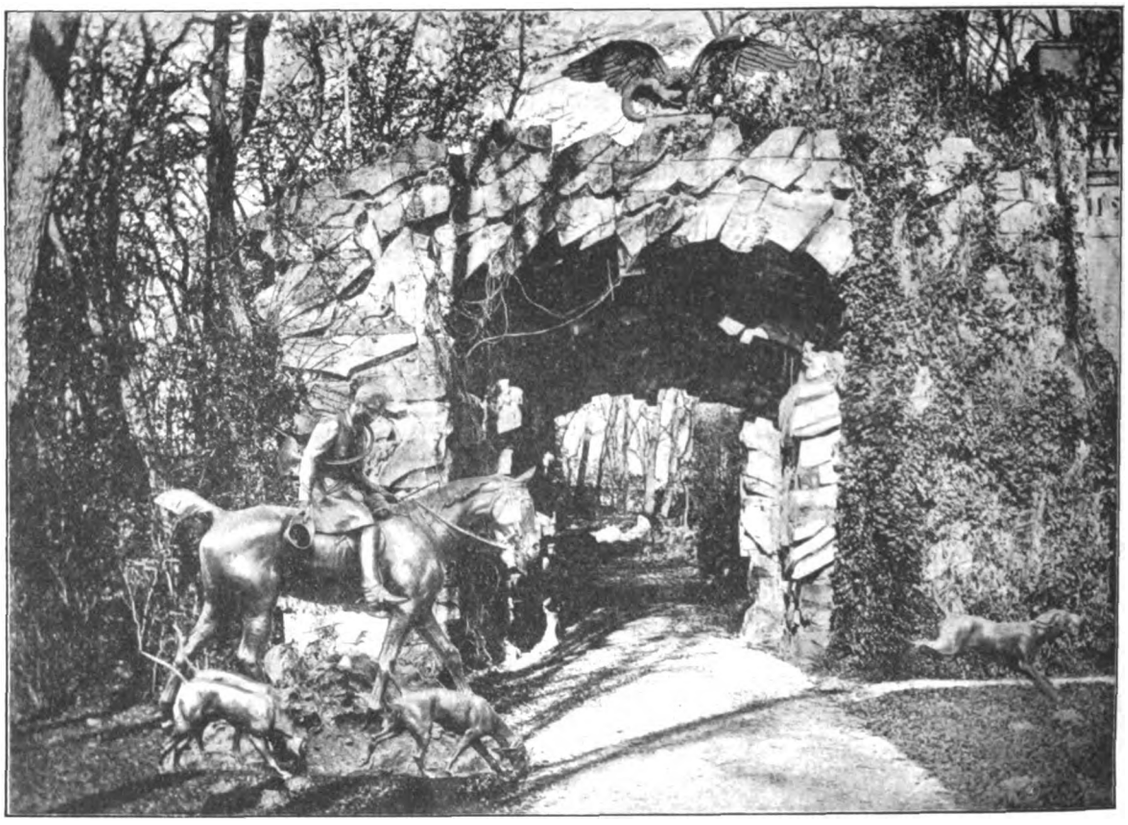
TOWN PLANNING EXHIBITION, BERLIN.—HAMBURG TERMINAL RAILWAY STATION.

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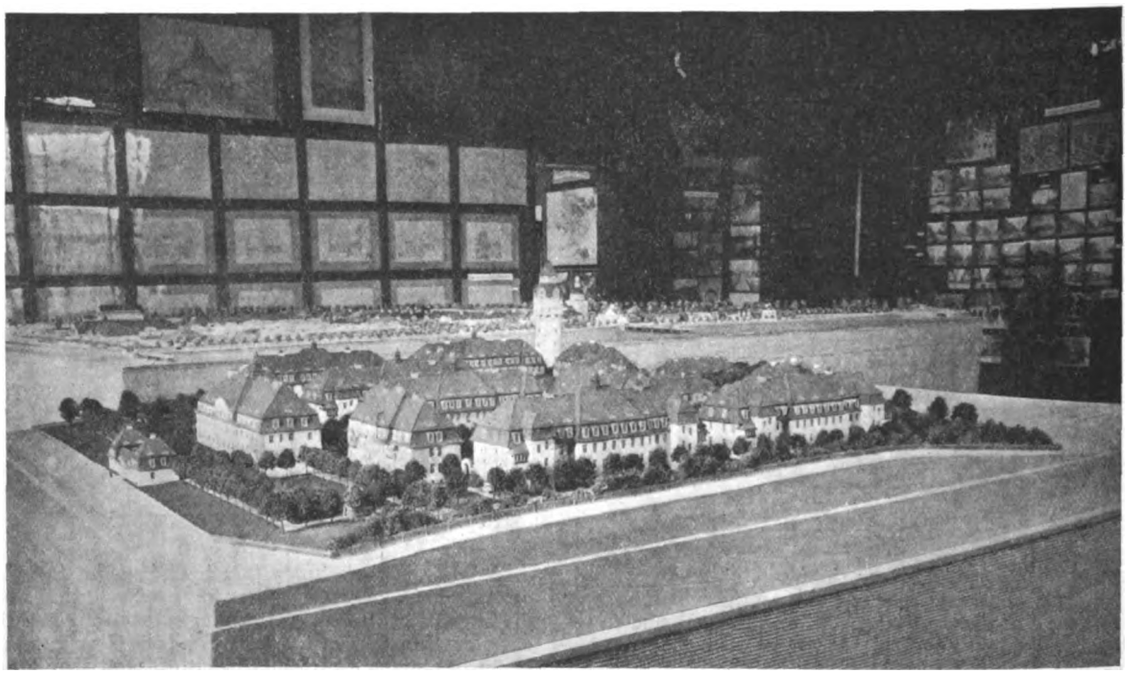
various requirements, and these we can divide into three main groups—(*a*) transportation, (*b*) sanitation, (*c*) æsthetics. The Berlin exposition comprised these three groups.

In taking up the first, the Prussian State railways, many private lines, the Imperial Statistical Bureau and street car companies have sent a remarkable number of diagrams, maps and models. From these we see that the best advantages are realised by radial lines emanating from the inner districts, and circular railways are not greatly profitable. The enormous cost of building underground lines warrants their existence only within the city proper, and, as one diagram shows, the suburbs are best served by level or elevated railways. We were surprised at the large participation of foreign countries, for we found many plans and pictures of the London underground network, the Paris Metropolitan and the elevated routes of New York, Chicago and Boston. A big wall painting and an immense model of the Pennsylvania Railroad afforded an insight into the complicated tunnel system of New York.

The above-mentioned prize competition for a future Greater Berlin provides for the removal of several terminals to the outer districts and the combination of some large terminals within the city borders. It can clearly be seen how level railways, ploughing straight through the city, disfigure it and are the cause of many round-about traffic routes. In this connection some kind of a revolution will doubtless take place in the German capital requiring an outlay running into millions. Wonderful projects of such combination terminals were shown. It is planned to remove everything not absolutely necessary into the outer districts, such as most repair



TOWN PLANNING EXHIBITION, BERLIN.—ROYAL GARDEN AT POTSDAM.



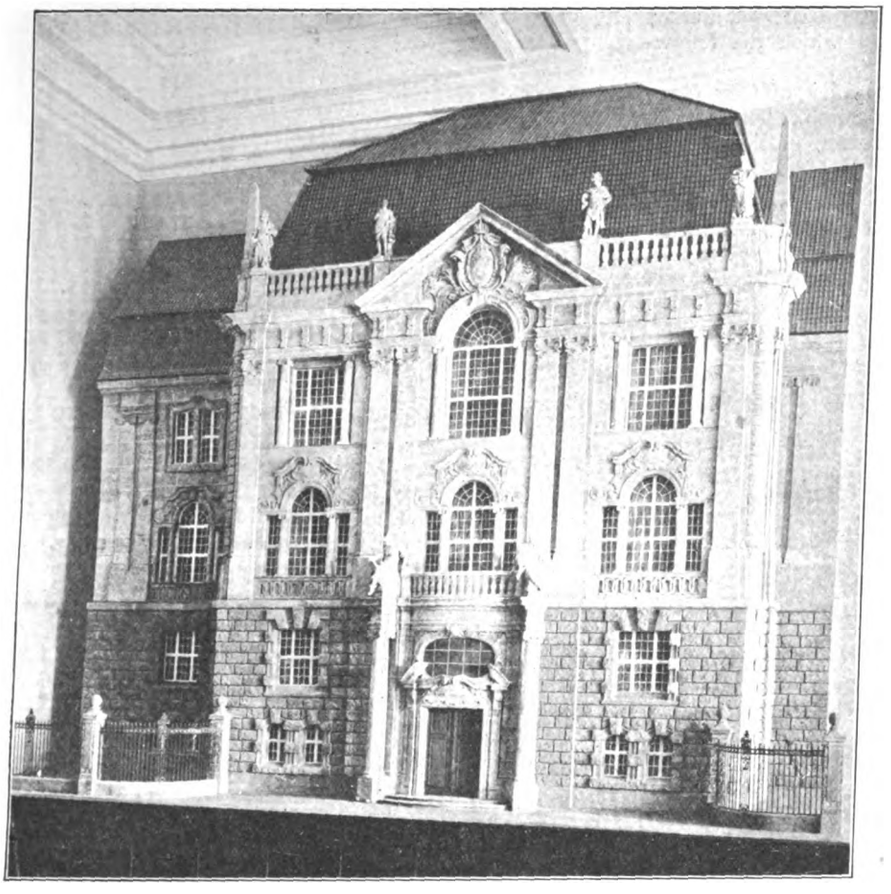
TOWN PLANNING EXHIBITION, BERLIN.—MODEL OF HOSPITAL BELONGING TO THE CITY OF BERLIN.

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shops, freight stations, storehouses, locomotive stands, &c., and to keep only a small portion in the central district. An underground line for the baggage and perhaps for passengers will connect the large terminals.

To the sanitary department belong canalisation, drainage, water supply and parks. We find illustrated the noted belt of forests and meadows of Vienna and Boston, the first being exhibited by the city itself in the shape of an immense model, the latter by the Metropolitan Park Commission, with the co-operation of forty communities belonging to Greater Boston who spent 150,000,000 marks for their beautiful system. These will especially be a model for the future park system of Greater Berlin, which, however, already owns some fine promenades, the famous deer-garden and smaller parks. Another attraction was the numerous small parks of Chicago connected with playing-grounds laid out at a cost of seventy to eighty million marks. The exhibitor is Mr. Daniel H. Burnham, who also sent his projects for a future Greater Chicago, this being a valuable pendant to the designs of a future Berlin. Very pretty are the gardens laid out by the municipalities of New York, Brooklyn, Baltimore, Washington and Chicago. We were impressed by the rowing and swimming ponds, apparatus for gymnastics, reading rooms, golf fields and wading pools for the little ones. The latter will be installed immediately in the German capital as a result of the exposition. In Europe a special item is the turning of ruins and remains from fortified places into parks, which has been steadily done since the Franco-Prussian War. In many towns of Germany not a single wall or ditch has been left, and a mere stone with an inscription tells that on those beautiful spots a hundred or more years ago raged terrible wars. Paris, Bremen, Magdeburg, Cologne and Hamburg were big fortresses, and there a few remains are still to be seen. Cemeteries belong also to this department, and we have some fine examples from Munich, Hamburg, Ohlsdorf and other cities where new cemeteries were laid out a few years ago after a new principle. Formerly they were nothing more than flat grounds with one row of simple graves beside another. Now we make the burying-grounds real places of recreation, with fine walks, driveways, flower-beds, meadows, fountains, seats and bushes.

The artistic, economical and social side of the art of city-planning is treated in the third department, although, of course, they are dealt with partly in the former. We found a rich number of solutions as regards streets, routes, drives, squares which reach the beautiful effects of the Middle-Age style, but transferred to the airy and bright conditions of the modern large city. The grouping of public buildings is represented in great variety chiefly by models. The late Prussian Ministerial Director, Dr. Althoff, had worked out a far-sighted plan to remove a large portion of Berlin's scientific institutes—for instance, the university, State library, academy of arts and other colleges connected with the first—to one spot in a suburb where there is more and cheaper space. It would thus be possible to build the various houses farther apart with pretty surroundings and large courts, as is the case with most American universities, which were also represented at the exhibition. A beginning has already been made by the Botanical Gardens and Museum with the various institutes that are now settled in the Western suburb, Dahlem, taking up six times as much space as formerly in the inner city. American colleges are not hampered by space and old traditions, so they can be laid out in pretty surroundings and rather far apart.



NEW LAW COURTS, BERLIN, FROM MODEL AT TOWN PLANNING EXHIBITION.

As regards thoroughfares, those in Germany are mostly curved, a feature of all towns that are centuries old, and these offer, with their crooked routes, quaint gabled houses and corners, a picturesque sight, admired by many a foreigner who has a sense for art, æsthetics and history. As the German nation is noted for that sense, it is clear that they try to preserve these fine specimens of ancient art, although modern traffic and development, as well as sanitary considerations, call for the removal of these old districts. This would indeed be the simplest way, and would certainly be carried out in the United States, which can boast of having towns looking like a chess-board, with the ugliest and most monotonous streets. In the exhibition wonderful examples were seen of projects, as well as executed examples showing the "new street," complying both with the artistic demands and with those of transportation. Such a modern German street is straight and broad, but in order to bring life into the monotonous row of average houses, the street-crossings are placed some nearer, some more apart, and made as different as possible; also some monumental public buildings with front gardens are introduced, beauty spots, parks, statues, artistic lamp-posts and the like. A difference is always made between the business district, industrial quarters and residential parts, the former requiring higher buildings with smaller spaces, the latter employing the cottage system. As a horrific example, some American sky-scrapers are shown, which make those cities in the New World so ugly and take away so much of air and light. The garden city movement originated in Great Britain has become popular too in the German Empire, some beautiful models being shown of several garden cities around Berlin, Dresden, Hamburg and the working-class colonies of the cannon king, Krupp, in Essen, started fifteen years ago. English examples, chiefly pictures from Letchworth and Port Sunlight, occupied a whole room. Diagrams showed that the mortality rapidly decreases the further apart citizens live, whilst it is very high in densely populated quarters, the worst examples being the tenements in New York. All these districts should be interrupted by some green spots, and large parks in the outer portions, while a whole stone desert—as we may call a modern large city—should be surrounded by a green belt of meadows and woods, which, however, should not form a closed geometrical ring that would make expansion and transportation difficult, but should be planned in the form of wedges grouped with intervals around it, with straight and wide thoroughfares between.

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There is, as we see, an enormous work still to be done and requiring many millions of money. New plans for building and new regulations should be made at once, according to social and economical principles; then artistic effects will come uncalled for. Then the pseudonyms of the prize-winners will become true—Within the limits of possibility! Think of the future! Peace on earth! Where there is a will there is a way!

We illustrate some of the exhibits at the Berlin exposition.

ILLUSTRATIONS.

BREWERS' HALL.

THESE drawings of the Brewers' Hall, by Mr. Albert E. Bullock, A.R.I.B.A., won the second Royal Academy Silver Medal for measured work, 1906.

A good description of this Livery Company is to be found in Messrs. Way and Norman's "Ancient Halls of the City Guilds" (Bell: 1903). There is a fine entrance to the courtyard at No. 18 Addle Street, Wood Street, E.C. Messrs. Wheatley and Cunningham give a short description in "Old London," from which the following is taken:—

"This guild is fourteenth on the list of City Companies, and was of very early foundation. The records were originally kept in Norman-French, until the reign

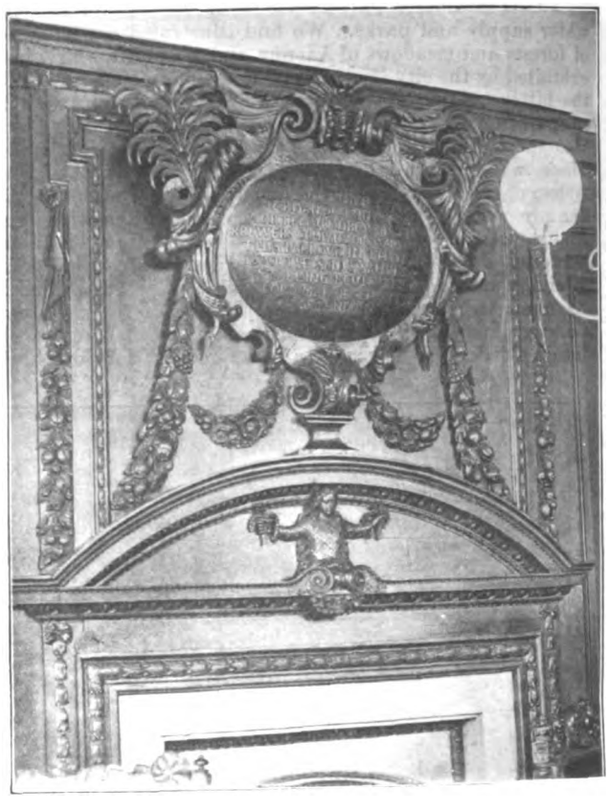


EXTERIOR.—STAIRCASE IN COURTYARD.

of Henry V. The Company was incorporated 16th of Henry VI. (1438), and confirmed 19th Edward IV. by the name of St. Mary and St. Thomas the Martyr, and again by Elizabeth (1562 and 1579), and by Charles I. (1639), and James II. gave a new charter in 1685. The Hall was destroyed in the Great Fire, and rebuilt shortly after. It is spacious and stands in a large courtyard, to which there is a handsome entrance in Addle Street. The Hall was repaired in 1828 under W. F. Pocock, architect. The court room was wainscotted in 1670" (by Samuel Sterling, Lord Mayor). "The houses in front were rebuilt about 1875 or 1876.

"*Coat of Arms.*—Gules a chevron argent, charged with three barrels sable hooped or, between three pairs of barley garbs saltire-wise proper. *Crest.*—On a wreath a demi-Moorish woman couped at the knees proper, her hair dishevelled or, habited sable, frettée argent; her arms extended, holding in each three ears of barley of the second. *Motto.*—'In God is all our trust.'" (Way and Norman.)

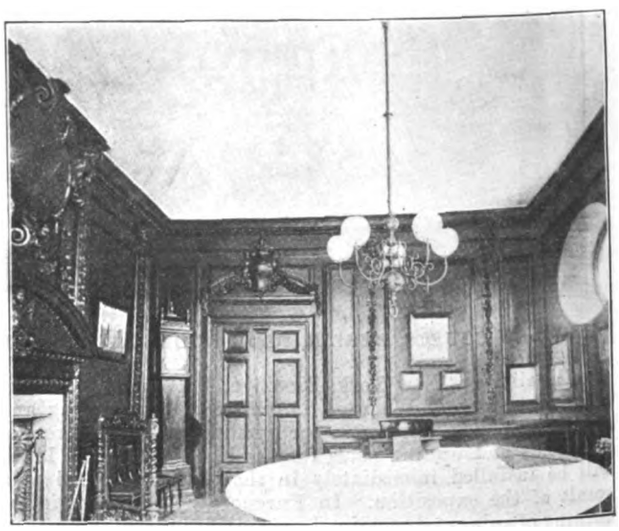
There is a window depicting this coat of arms and



INTERIOR.—CHIMNEY-PIECE IN COURT ROOM.

motto, and the crest forms the terminal to the fine screen at the entrance, which is dated 1673.

The oval table in the court room was used in olden times on the Company's barge.



THE COURT ROOM.

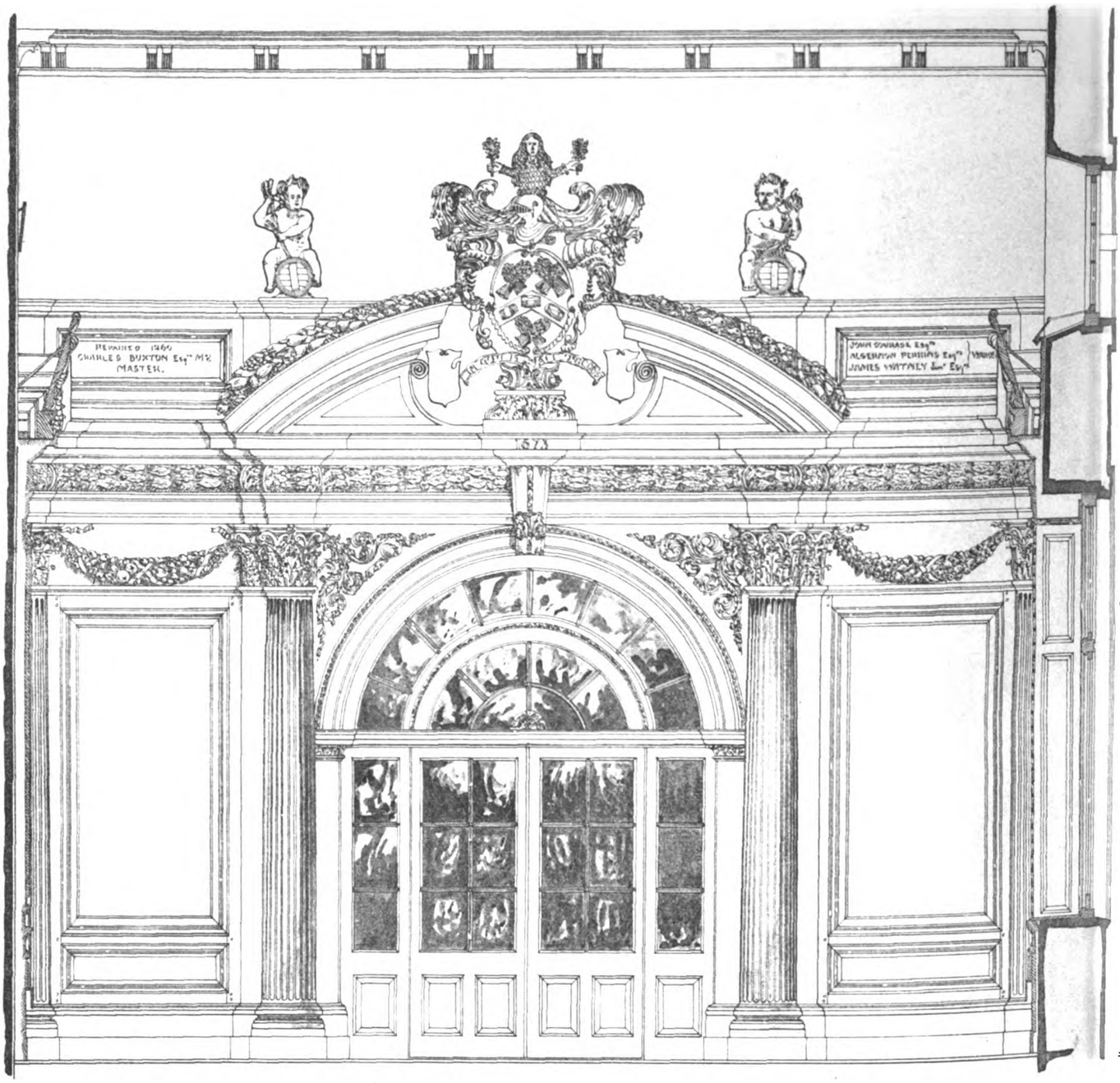
In the kitchen is a fine old lead cistern, dated 1671, with the arms of the Company moulded on. The Hall is only wanting in a fine ceiling to make it one of the best of the Livery Companies' halls in London.

Mr. Campbell Douglas, F.R.I.B.A., who died aged eighty-one, of 25 Braid Avenue, Edinburgh, architect, late of the firm of Messrs. Campbell Douglas & Paterson, of 266 St. Vincent Street, Glasgow, left personalty of the value of 8,023*l*.

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THE BREWERS' HALL.
DETAILS of SCREEN



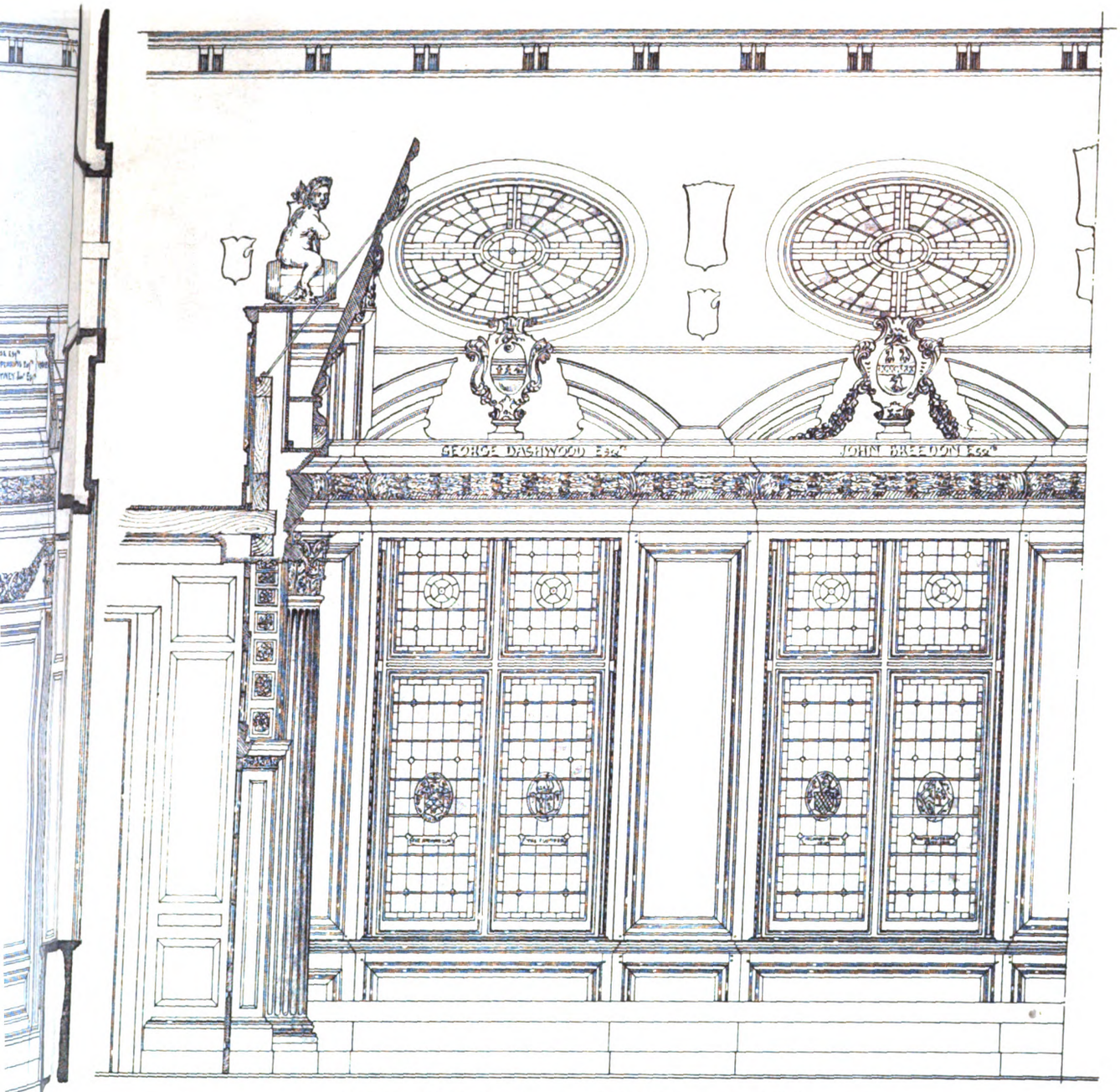
ELEVATION of SCREEN



PLAN

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The Architect, Aug: 26th 1910.



SECTION & TWO BAYS LOOKING SOUTH.

Scale 12 6 0 1 2 3 4 5 6 7 8 9 10 of Feet.

"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE E.C.

FUL COMPANY OF BREWERS.

A. E. BULLOCK, A.R.I.B.A.

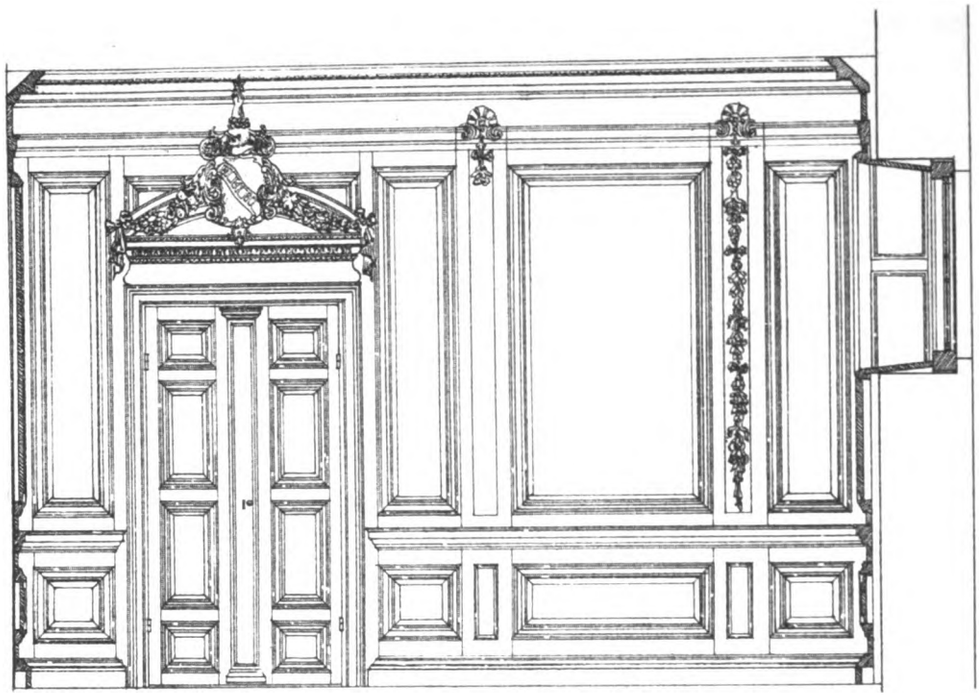
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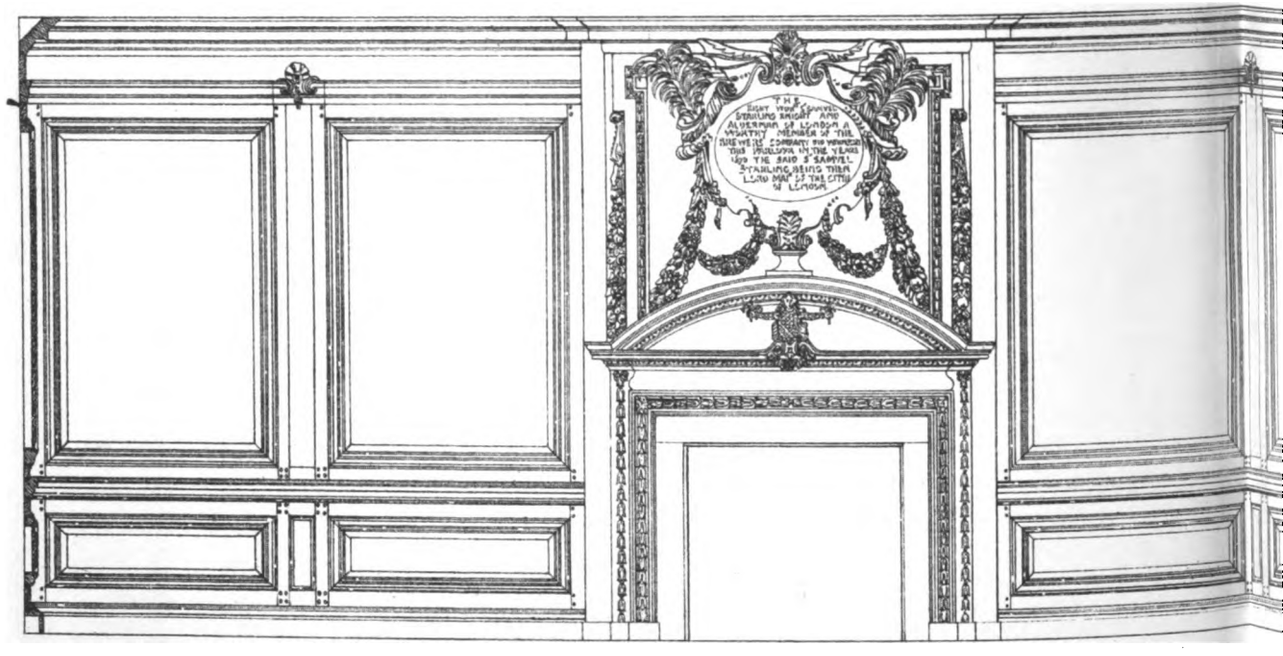
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THE BREWERS' HALL
DETAILS OF PANELLING IN BOARD ROOM

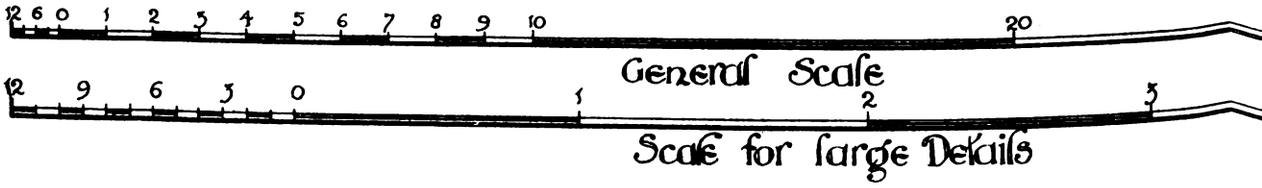


ONE SIDE OF BOARD ROOM
LOOKING WEST



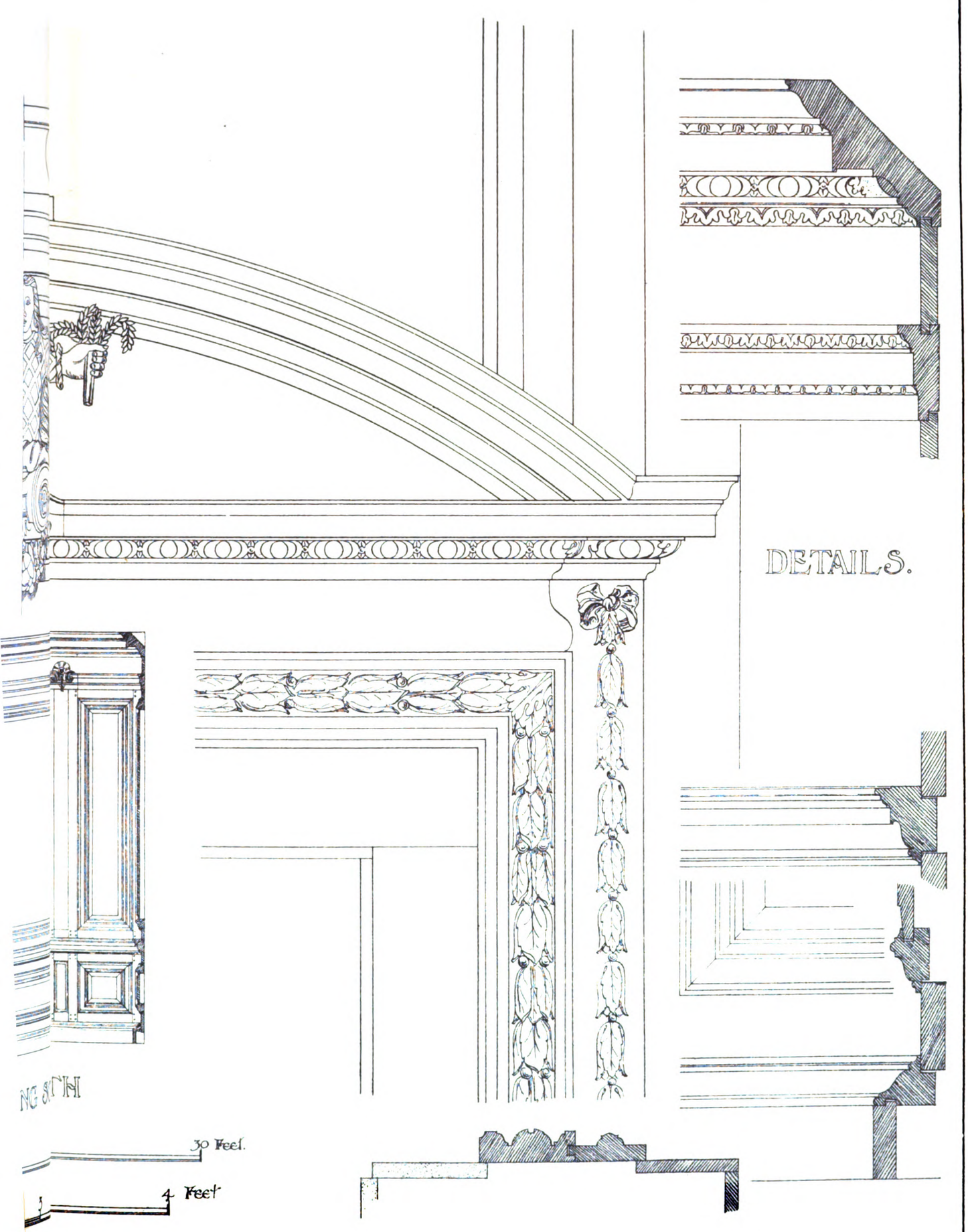


ONE SIDE OF BOARD ROOM LOOKING SOUTH



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This is Aug: 26th 1910.



FUL COMPANY OF BREWERS.

A. E. BULLOCK, A.R.I.B.A

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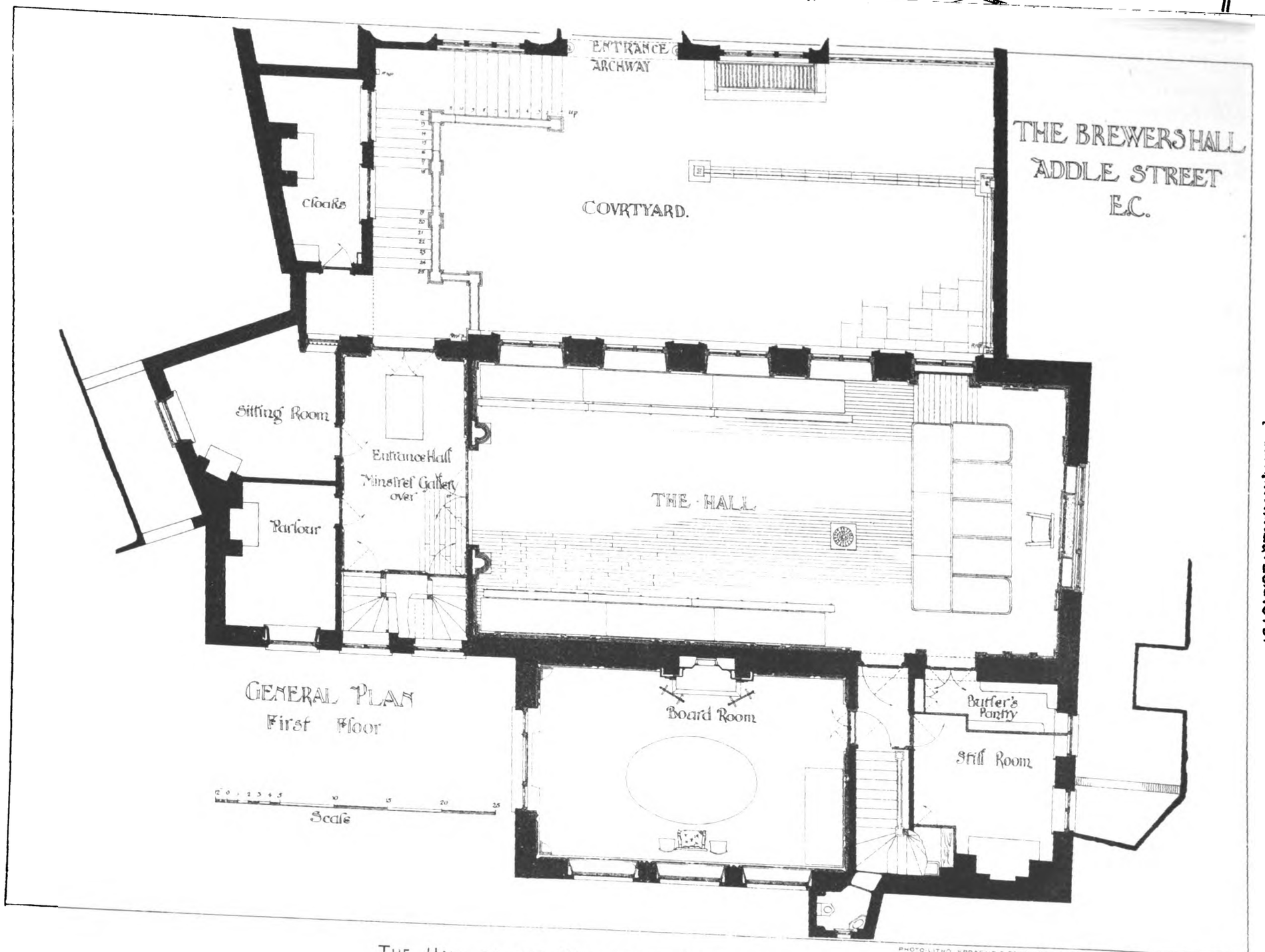


THE HALL OF THE WORSHIPFUL COMPANY OF BREWERS.

Measured and Drawn by Mr. A. E. BULLOCK, A.R.I.B.A

The Architect, Aug. 26th 1910.

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THE HALL OF THE WORSHIPFUL COMPANY OF BREWERS.

Measured and Drawn by Mr A. E. BULLOCK, A.R.I.B.A

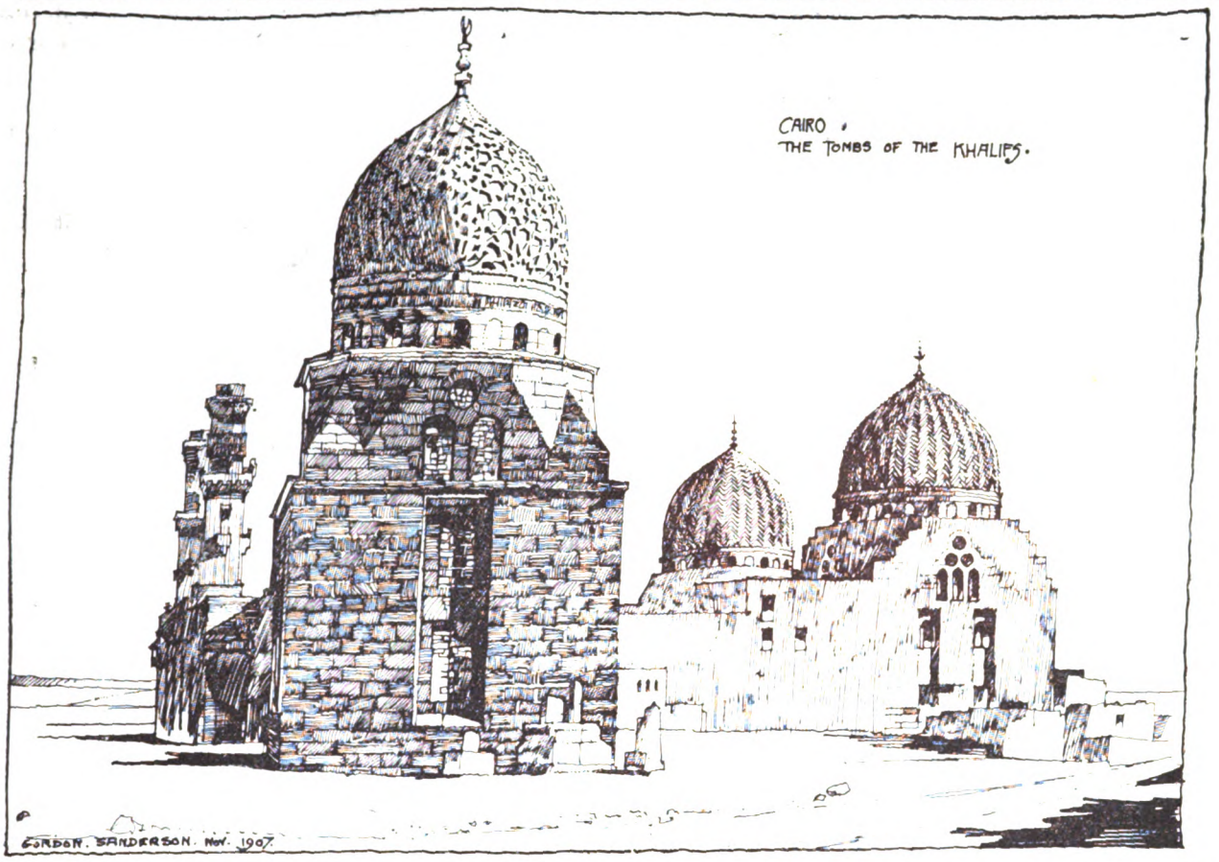
PHOTO-LITHO SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

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MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

XVI.—COLD STORAGE CALCULATIONS.

As stated in the last article, it is safest, when drawing up a guarantee to be upheld by the builder of the refrigerating plant, to state the duty of the machine in terms of the space to be cooled and the quantity of produce which the machine has to cope with in the course of a day. We must then clearly define:—

1. The dimensions of each room.
2. The temperature at which each is to be maintained.
3. The nature of the insulation.
4. The quantity of produce which will be put into the respective chambers daily.
5. The number of hours per day for which the machine is to run.

By this means the responsibility of deciding what size of machine it will be necessary to instal is thrown entirely on the shoulders of the manufacturer. It will be interesting, however, to see what sort of calculation is necessary and how he arrives at his conclusions, and to this end we shall follow through a short numerical example.

It will be assumed that one chamber only is to be cooled, measuring, internally, 20 feet by 20 feet by 7 feet 6 inches high; 70 cwt. of beef will be placed in the room daily, and during a run of 10 hours must be cooled to the requisite storage temperature, at which beef brought in and cooled on previous days must also be maintained. The temperature we shall take in the first instance as 32° Fahr., and in the second as 24° Fahr., in order to see what difference is made in the necessary size of machine for temperatures below freezing point. It is further stated that the insulation will consist of 6 inches of silicate cotton.

Assuming that the beef is fairly fat, the necessary data are as follows:—

Specific heat of beef above freezing	0.60
Specific heat of beef below freezing	0.34
Latent heat of freezing	72 B.T.U.'s.
Heat leakage coefficient	3.0

The last-named represents the number of B.T.U.'s which will be lost by radiation through 1 square foot of the specified insulation in 24 hours, for each degree Fahrenheit of temperature difference between the inside and outside of the walls. It is made very much larger than the value obtained by experiment, in order to cover leakage through opening of doors, imperfect joints, &c.

Taking the first storage temperature, namely, 32° Fahr., we find that we have two things to consider; firstly, the cooling of 70 cwt. of beef in 10 hours from maximum temperature (say 82° Fahr.) to 32° Fahr.; and secondly, the overcoming of the heat leakage due to a temperature difference of 50° Fahr. between the inside and outside of the walls, floor and ceiling of the specified room.

The B.T.U.'s required daily for the first, since the specific heat of the beef is 0.6, and the temperature fall 50° Fahr., equal $70 \times 112 \times 50 \times .6$, or 235,200. For the second, the superficial area of the walls, floor and ceiling of the room are together equal to 1,400 square feet, the temperature difference is 50° Fahr., and the leakage coefficient is 3. Hence the total leakage in 24 hours is $1,400 \times 3 \times 50 = 210,000$. We have now—

B.T.U.'s to be extracted from beef	235,200
B.T.U.'s to compensate for heat leakage	210,000
Total	445,200

This number of units must be absorbed during a run of 10 hours, and we must therefore put in a machine which would absorb during a 24-hour run, $2.4 \times 445,200$ B.T.U.'s. Remembering that 1 ton of ice melting capacity means $2.240 \times 142 = 318,080$ B.T.U.'s in 24 hours, we see at once that the machine must in that period be capable of producing $\frac{2.4 \times 445,200}{318,080} = 3.36$ tons refrigeration, adopting the measure of capacity which is commonly in use.

In the second case, all the water in the meat (amounting in the case of fat beef to 51 per cent. by weight) must be frozen, and we must accordingly take account of its latent heat, as expressed above. The number of B.T.U.'s to be taken from each pound of beef will then be as follows:—

Reducing temperature from 82 to 32° Fahr.	$.06 \times 50 = 30$	B.T.U.'s.
Latent heat of freezing	$= 72$	"
Reducing temperature from 32 to 24° Fahr.	$0.34 \times 8 = 3$	" nearly.
Total	105	

Hence the total number of B.T.U.'s to be extracted in 10 hours is $105 \times 70 \times 112 = 823,200$. The heat leakage per

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24 hours is equal to $1,400 \times 3 \times 58 = 243,600$ B.T.U.'s. We have therefore:—

B.T.U.'s to be extracted from beef	823,200
B.T.U.'s to compensate for heat leakage . . .	243,600
Total	1,066,800

Reducing this as before to tons refrigeration per 24 hours we find the machine must have a capacity of $\frac{2.4 \times 1,066,800}{318,080}$ = 8.05 tons, or in other words it must be about 2.4 times as large as that required for the higher temperature of storage.

In any cold storage problem the calculations to be made are exactly similar to the above, although, where different temperatures are to be maintained, then the refrigeration required for the weight to be cooled to each must be calculated separately, and the total found by addition. The heat leakage will also vary in different rooms, and across different partitions, but in the majority of cases may, as far as the latter are concerned, be neglected.

Different types of goods have different physical constants, and some are much more difficult to cool than others. Their qualifications in this respect depend almost entirely on the percentage of water present, owing to the strongly marked physical constants possessed by that liquid. And, to show the variations, the principal figures for some of the goods more commonly met with are given in the following short table (due to Prof. Siebel):—

Substance.	Percentage Water.	Specific Heat above Freezing. ° F.	Specific Heat below Freezing. ° F.	Latent Heat of Freezing. ° F.
Lean beef . .	72.00	0.77	0.41	102
Fat beef . .	51.00	0.60	0.34	72
Fat pork . .	39.00	0.51	0.30	55
Cabbage . .	91.00	0.93	0.48	129
Milk . . .	87.50	0.90	0.47	124
Whitefish . .	78.00	0.82	0.43	111

Calculations must of course be modified to suit the particular class of goods which is to be dealt with.

Testing.

The best test of a machine to be used in cold storage is the continuous working on full load obtained in practice, and part payment, if thought necessary, may be withheld, with a view to carrying out this test fully. If further proof of sound workmanship is desired, arrangements may be made whereby each section of the system, coils, headers, compressor, &c., is tested under air in the presence of the purchaser or his advisers, to a pressure at least double that usually met with, and the contractor should also be called upon to guarantee his plant against defects due to bad workmanship or material, for a period of say twelve months.

Hotels and Restaurants.

The application of the freezing machine to hotels and large restaurants consists mainly in cooling stores for various kinds of provisions, meat and game principally, but also butter, wine, milk, &c., at times. In addition, some of the larger hotels have their own ice-making installations.

The cold stores are of two types; there are, firstly, the main storage rooms, where provisions are stored for a day or two, after being bought in bulk, or where the surplus can be placed when the day's requirements have been met; and, secondly, there are the service cupboards which are constantly being used for an hour or two, to keep provisions of various kinds during the hot days of summer, and also as a very effectual means of icing wines.

One of the most complete installations of this character is that at the Ritz Hotel, Piccadilly, where there are storage rooms and service cupboards, and also an ice-making plant capable of producing some 4 tons of ice per day. The refrigerating machine which controls the three departments is on the ammonia absorption principle, by Messrs. Ransomes & Rapier, Ltd., and is connected up to a large brine cooler, in the shape of an insulated tank of suitable capacity. The brine having been reduced to the desired temperature is circulated to and from the cupboards, stores, and ice tank by two motor-driven centrifugal pumps, one of these being used as a stand-by.

Ice-making tanks will be described in a later stage, but, it may be noted that in this case, the distilled water from which the ice is manufactured is obtained from the condensed steam exhausted from the absorption machine. Usually these machines, where possible, are worked by the exhaust steam from steam engines or turbines, as otherwise they are uneconomical, but in the Ritz plant, a special boiler has been installed, lest any engine oil or other contamination should reach the ice moulds. The latter are filled by an automatic filler, and, when the ice has been formed, are removed by a small travelling crane running on joists at either side, to the ice dump, where the blocks are thawed out by means of the waste condensing water coming from the machine.

Figs. 48 and 49 illustrate the appearance of the service cupboards, that shown in fig. 48 being used for sundries, and that in fig. 49 for mineral waters. In both cases, it will be noticed, the block is divided up into a number of small cupboards, each with a separate door. The advantage of this arrangement is that it minimises the leakage of heat due to opening of large doors. It also allows all sorts and conditions of goods to be stored in one block, without undesirable odours being transmitted from one to the other. In the case of susceptible goods, such as butter, this is most important.

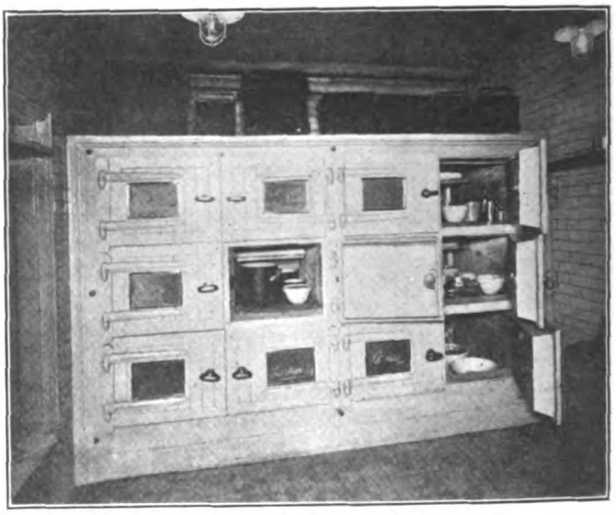


Fig. 48.—REFRIGERATED SERVICE CUPBOARD, RITZ HOTEL.

The cooling of each block is effected by a brine drum at the back, connected to the brine pump and cooler, over which the air from the various compartments is circulated. Slates are provided on all cupboard doors to register the contents, and an airtight joint is obtained when the doors are closed by suitable fasteners and a course of rubber tubing. The insulation, needless to say, must be carried out as carefully in these cupboards as in building an ordinary store.

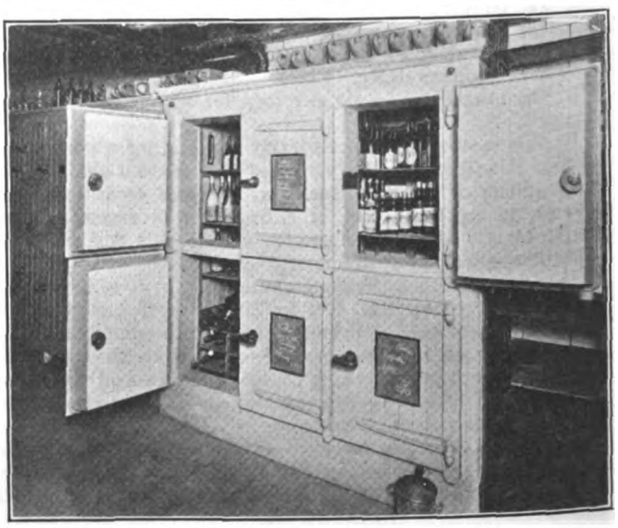


Fig. 49.—REFRIGERATED WINE AND MINERAL WATER CUPBOARD, RITZ HOTEL.

The arrangement of the two cold rooms, one for game, and the other for meat, is shown in fig. 50, which gives a plan view, cross-section and sectional elevation. Neither room is intended for long storage, and consequently the temperature in each need not be reduced below about 35° Fahr.

At this temperature, as we know, it is most important that there should be a continuous uniform circulation of cold

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dry air over all the goods stored, and this is attained in this case by means of the two separate coolers, and the air trunking shown in the illustration.

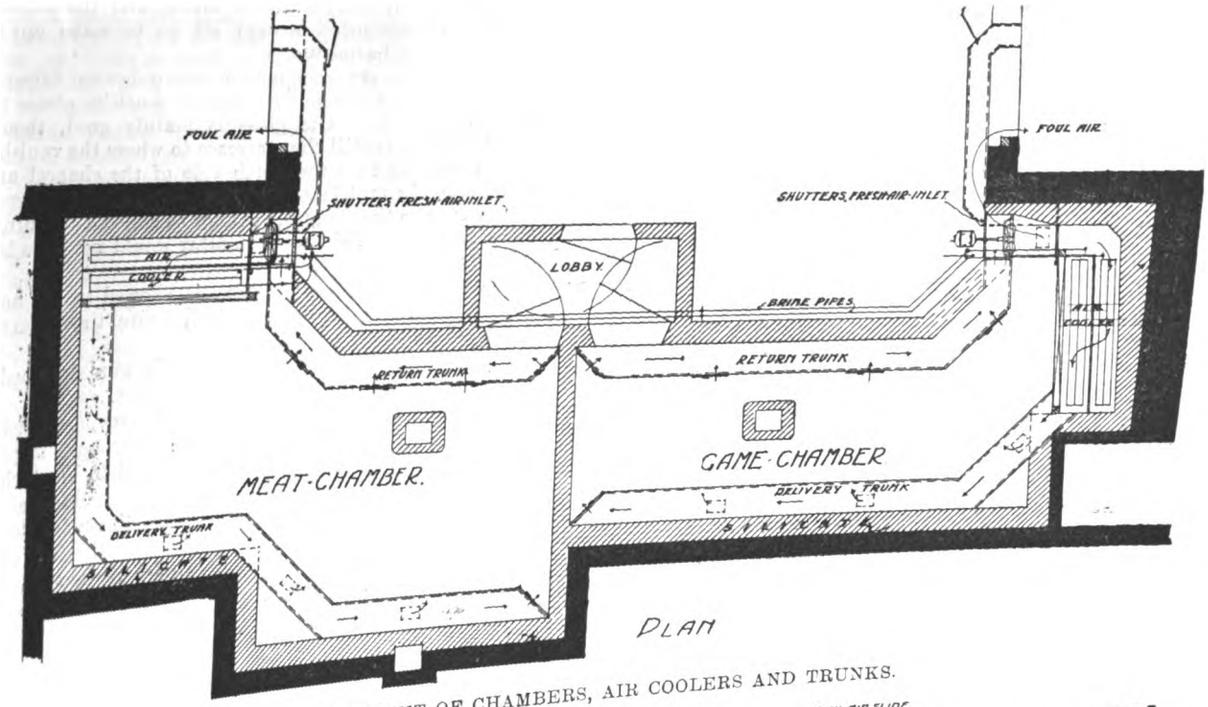
Each cooler consists of two stacks of brine piping, connected by flow and return pipes to the pump and cooler in the machine room. The two stacks are separated by a wooden diaphragm, 1 inch thick, extending from the top of the cooling chamber down to within 6 inches of the bottom, and, by this means, the air is caused to pass over first one stack and then the other. Following its course right round the circuit, we find that after cooling the provisions, in its passage through them and being heated itself in the process, it returns by the suction air trunk through the openings at the bottom of the trunk, and then discharged by the electrically driven fan, it is conveyed by a regulating opening of the first stack of tubing. The diaphragm reduces its temperature and it passes under the diaphragm. Being still further cooled by the second stack, it rises into the trunk into the

The delivery trunks, it will be noticed, are fixed to the ceiling in order to economise floor space, but for the best circulation, as already explained, they should have been run along the floor. To compensate for this defect as much as possible, however, a stronger circulation has been adopted, and the slides have been placed in the bottom of the trunks, with a view to impelling the air downwards as it emerges.

It is important to keep the coolers entirely separate from the rooms, and to this end strong partitions, containing removable doors are provided. These, together with the walls surrounding the cooler are lined with zinc, to prevent the timber rotting through the action of the moisture deposited by the air.

The moisture then drips from the zinc and the tubes to the bottom, where it is collected in a lead-lined trough, and conveyed to the outside of the insulation by means of a trapped outlet pipe.

It was thought, in this instance, that the opening of the doors would not be sufficient to provide an adequate supply of fresh air, and accordingly shutters and outlet slides have been fixed in the suction and delivery slides respectively of the fans. These can be opened and foul air expelled or fresh air



ARRANGEMENT OF CHAMBERS, AIR COOLERS AND TRUNKS.

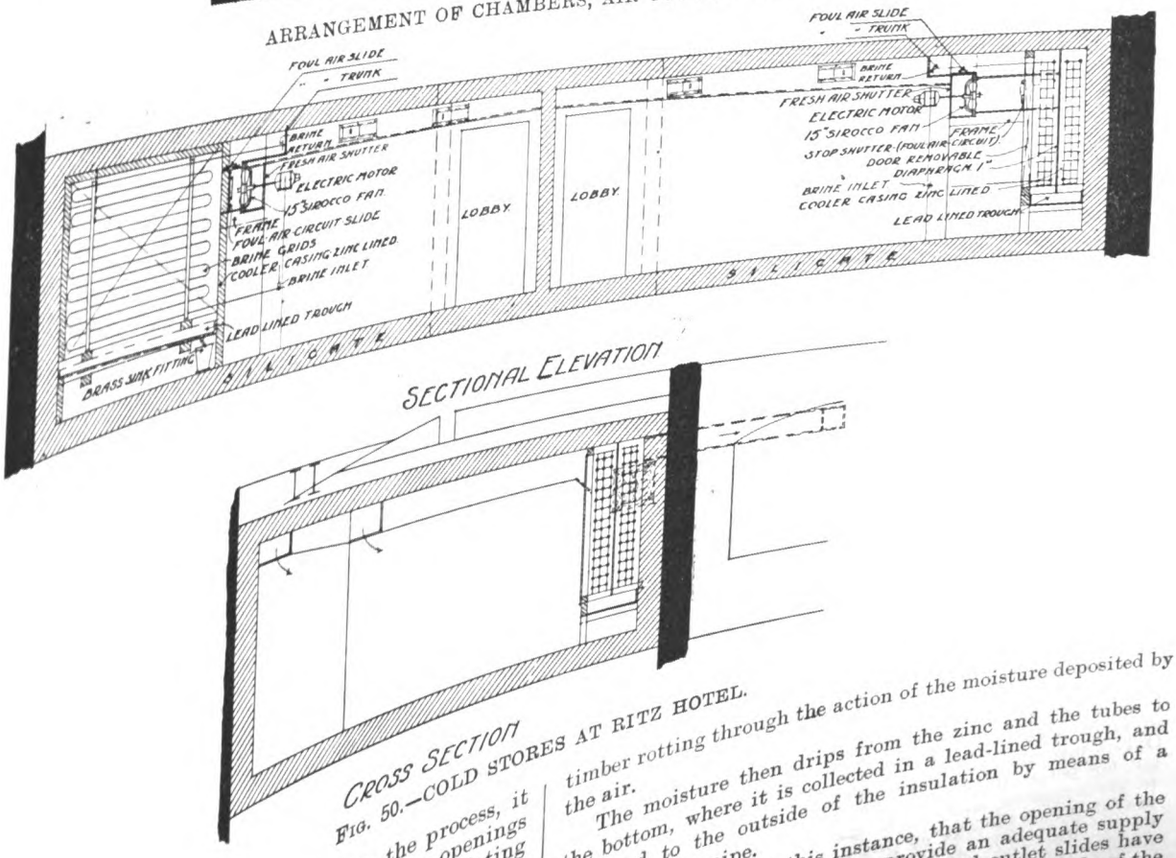


FIG. 50.—COLD STORES AT RITZ HOTEL.

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taken in at will, although it is only occasionally that the operation is necessary.

The insulation of the air lock (seen in front of the chambers), and the rooms themselves, is carried out with silicate cotton and timber, affixed as a lining to the existing walls, and the columns, one of which comes in each room, have also had to be well covered to prevent heat being carried in through them from the floor and ceiling.

The whole plant, as will be seen from the foregoing, is most extensive and well adapted for hotel purposes, but it is only in large establishments, like the Ritz, that the outlay necessary for such an installation can be spared. For an ordinary hotel a much less elaborate arrangement must be made to suffice, and although the cold stores and the expedition refrigerators remain much the same, the ice tank, as a general rule is either omitted, or greatly reduced in size. The absorption machine, too, is more commonly replaced by a motor-driven compressor, which takes up rather less space, is easier to handle in the small sizes, and, unless exhaust steam is available (which is seldom the case in hotels) is more economical. In such a case distilled water would not be available for clear ice making, but instead, the ice tank would be fitted with some form of agitating gear.

Another advantage of the ordinary compression plant for this work is that less cooling water is consumed, especially if the condenser is of the atmospheric type, which cannot conveniently be fitted to the ordinary form of absorption machine. In towns, where hotels are usually situated, and where no natural source of supply is available, this is most important.

A SURREY PARADISE.

By John A. Randolph.

SNUGLY tucked away in a corner, at the foot of a range of hills, within easy walk of two other counties, an old-world settlement, which is a dream of loveliness of both the natural and the architectural order, lies bathed in the summer sunshine. Less than a quarter of a mile away is a "new" quarter, on a larger scale and more gaudy than, but still in good harmony with, the only old house in it, and leading up, in a few yards by a fairly broad road, to the unpretentious but severely modern railway station.

It is true the line does come there, but by wonderful good fortune—if good taste on the part of the railway company had no voice in the matter—it is tolerably unobtrusive on each side of the station from the road, and is most judiciously placed at a convenient distance from the old village; and we are glad to note there is no string of the ultra-suburban type of houses connecting the two, and the little paradise has, fortunately, little chance of being ruined by the spirit of modernity in all its blatant vulgarity and shamelessness of painted brick, sham pointing, stucco, carpenters' porches (of atrocious design and worse fit), flaunting red tiles, "new art" stained-glass to the doors and window-tops, and names more fit for Bedlam than for dwellings of people who should be rational beings.

The intervening ground between the new and the old parts is pure country, over rising ground, with fine trees, between which, over the hedges, one sees a valley extending far away to the west right across the county, with the bold hill-range of the North Downs as a background against the summer sky. On reaching the top of the rise, the eye alights with infinite satisfaction on the singularly picturesque old village rising from the foot of the hill in front and clambering up it, with its irregular "building line" and its old-fashioned cottages and shoplets dominating the little vale, and its row of severe small gables, snugly huddled together, overlooking a kitchen-garden approached by steps between two cottages from the main road. Those gablets remind one more of the well-known series at Aylesford than anything else.

Gradually climbing the hill of the village, the Post Office is found at the top approached by a short path on a built-up bank, and protected by a handrail. Here, as well as at the old house in the "new" quarter, can the post-card collector revel to his heart's content, each of the two shops having different views of the singularly fascinating old church. Only a few yards more, and the end of the village is reached, but not before passing an inn—the Bell—of greater beauty, picturesqueness, and architectural interest than the celebrated one of 1388 at Godstone (some three and a half miles on to the west). A few more steps, and one is again in absolute peaceful country.

It seems as if everything had been done here for the archæologist, the architect, and the artist within the smallest possible space, and when they have visited the church as well, which is at only about a hundred yards from the station, they will one and all agree with us that in all Surrey they have never found a more interesting and more beautifully-situated spot, and that there can be few such gems in the whole country.

The church is a little cathedral. A massive crenellated low tower dominates it—the spire and the chancel were fired by lightning in 1719—and the strange irregularity of planning and roofing—the transepts are of different sizes and not opposite each other—and the wonderful windows of great length and graceful design in the aisles, and the colossal east window (fourteenth century) all go to make up an ensemble of perfect harmony.

Inside (the main entrance is by a square-headed fifteenth century door to the south porch) there is much to please the eye and to interest. The glass is mainly good, though modern; but there is still the staircase to where the vanished rood-screen was, and on the north side of the chancel arch there is a severely mutilated piscina and a curious narrow-vaulted passage to the choir; it cannot be called a "squint," for it is about 6 feet high, and the altar would not have been visible from the aisle through it.

It is a pity the ungainly gallery is allowed in the north transept to obscure the light and disfigure the otherwise charming interior.

The beautiful oak screen and the stalls were designed by Mr. J. Oldrid Scott, who lives in the district.

This, the most charming spot in Surrey, reached in twenty minutes from busy Croydon, through splendid scenery, and on the main road from Redhill to Westerham, though not overrun with the evil-smelling, dust-raising, ubiquitous motor-car, still resounds with the noisy toot of the horns, but the cars branch off mainly at the foot of the hill, when going eastwards, in the old part of the village.

A number of cyclists seem to have discovered the spot, judging from the shoals of them we met as we wended our way to Tandridge and Godstone from this delightful old Oxted.

THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

FIFTY-FIFTH ANNUAL EXHIBITION.

THE annual exhibition of photographs by the Royal Photographic Society, which for the last ten years took place at the New Gallery, is held this year at the Royal Water Colour Society's Gallery in Pall Mall. The exhibition, which remains open till September 16, is divided into four sections:—Pictorial, colour photography, natural history photography, and scientific applications of photography. The first and second of these sections are in the principal gallery, the drab and dull crimson drapery of which harmonises well with the monochrome prints. The third and fourth sections are hung in the two smaller rooms looking over Pall Mall.

In previous years the exhibits of apparatus and materials by the principal trade firms, and examples of professional work occupied a considerable portion of the space at the New Gallery, but are absent from Pall Mall, the whole of the available space being required for the competitive exhibits. A glance at the catalogue shows that practically the same number of photographs as last year have been accepted in the pictorial section, and that without overcrowding the walls. Although no one picture stands out in marked contrast to its neighbours, the general standard is undoubtedly high, and it is worthy of note that the exhibition is supported by most of the best known workers in all countries, maintaining the international character which has long been a feature of the Society's exhibitions.

This year, as last, the Society has asked that the processes by which the pictures are produced should be stated, and a fair proportion of the exhibitors have responded to the call, and it is possible to gauge with some approach to accuracy the extent to which these processes rise and fall in the estimation of the best workers. Bromide prints, which suffered a slight eclipse last season, take the premier position this year; the recently invented bromoil process is not far behind in numbers, and if we add those prints produced by the older oil process the two combined take the first place. Platinum prints are next on the list, having assumed the place formerly held by gum bichromate, and with the exception of some little used methods the beautiful carbon process is still lowest on the list.

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There are few examples of photographs produced in colour by the oil process, but these few are remarkably good and further advance may be expected as workers acquire facility in the use of their materials. The section is strong in quality and varied in subject, and the growing tendency to work in a higher key than in the past gives to the walls a brighter and more cheerful aspect than has been the case of late years. The narrower frames and lighter tinted mounts have also the effect of removing from photography the reproach of being the dismal art.

The collection of autochrome and other transparencies in colour is a small one, some eighty in all, including the scientific examples; but the section has benefited by rigorous selection, and every example is worthy of close examination. The autochrome, as was to be expected, far outnumber the others, but there are one or two examples of the Dufay dioptichrome process which promise well for this new claimant for popularity. A few transparencies by the Sanger Shepherd or triple film process are to be seen with other technical subjects in the scientific section.

The natural history section, though not large, is interesting in character and varied in subject, each exhibit having some peculiarity which warrants its inclusion. The scientific section has also been subject to stringent selection, and consists chiefly of photomicrographs and radiographs, although some stellar and cloud studies are also to be seen.

The exhibition is open morning and evening, and the lantern lectures—which are a popular feature in the Society's work—are delivered on Mondays, Wednesdays, Thursdays, and Saturdays.

GAS HEATING RESEARCH.*

(Concluded.)

Condensing Stoves.

THE estimation of the sulphur present in the condensed water then proceeded in the usual way. The results of the experiments may be seen by reference to Table 3. It will be seen that there are eleven experiments reported on. The sulphur (column A) varied between 11.33 and 13.98 grains per 100 cubic feet of gas. The amount of sulphur condensed varied between 2.87 and 5.18 grains (column B).

TABLE 3.

Experiment.	Sulphur in 100 Cu. Ft. of Coal Gas. at 30 inches. 60° Ft.	Sulphur Condensed from 100 Cu. Ft. of Coal Gas. Wet.	Total Water Condensed in C.C.	Percentage of S. Condensed.	Temperature of Room °C.	Temperatures of Outlet Gases.	Total Gas Burnt in Cu. Ft. at N.T.P.	Water in C.C. Condensed per 100 Cu. Ft. of Gas Burnt.	Iron (Fe.) Found in Condensed Water per 100 Cu. Ft. of Coal Gas Burnt.
									Grains.
1	10.54	2.98	—	22.3	23° C.	31° C.	—	—	—
2	11.28	2.68	2,150	23.75	20° C.	32° C.	186.5	11.6	—
3	12.01	3.09	2,350	26.33	19° C.	28° C.	227.0	10.3	—
4	12.36	3.49	3,690	28.3	18° C.	34.5	271.0	13.6	7.47
5	13.04	3.95	1,310	30.31	16.8° C.	34.3	108.0	12.1	5.95
6	10.56	3.21	2,950	30.35	16.5° C.	31.0	214.0	13.8	5.33
7	12.22	4.07	1,850	33.35	15° C.	29.0	117.0	15.5	6.9
8	11.34	3.78	2,500	33.36	15° C.	32.0	208	12.0	—
9	12.39	4.31	2,110	34.79	14.5° C.	29° C.	170	12.4	—
10	10.46	3.82	1,600	37.36	14.0° C.	30° C.	97	16.4	—
11	12.71	4.83	2,650	38.0	14.0	29° C.	213.3	12.49	—

The experiments were not done in the order shown in the table, but are arranged in this way to better indicate how the percentage of sulphur condensed (column D) varies inversely as the temperature of the room (column E). When the room temperature is as high as 23° C., the percentage of sulphur condensed is 22.3. When the room temperature is reduced as low as 14° C., the percentage of sulphur condensed is increased to 38. At a normal temperature (say, 15° to 16° C.), the percentage condensed is about 30.

The temperatures of the flue gases were determined (column F), and these indicate the mean temperature (30° C.) at which the flue gases enter the room. They do not vary with the temperature of the room as one might at first have expected. This is probably due to irregular draughts along the floor and to condensation and subsequent evaporation of water taking place on the bulb of the thermometer. This would cause the readings of the thermometer to be irregular. With the thermometer in the position described it would hardly be otherwise. In columns C and H are found figures relating to the amount of water condensed in the stove and in the porcelain dish beneath the stove. At a first glance one would have thought that the percentage of water condensed would have varied in a similar way to the amount of sulphur condensed—i.e., inversely as the change in temperature. From column H it will be seen that this is not the case, and, on a further examination of the point, the reason for this is evident.

In the condensation of the sulphur acids, the better the washing of the gases the larger the amount of sulphur acids will go into solution. The main part of the washing of the gases takes place on the inner sides of the tubes where water condenses and trickles down into the trough. In all probability, as far as the trough the percentage of water condensed does vary inversely as the temperature, so that the lower the temperature of the room the more water is condensed on the sides of the tubes and the better the washing of the gases. But what happens to the water that accumulates in the open porcelain dish at the foot of the stove? There may be anything up to a litre of water contained in it.

As the temperature of the room was varied for each experiment by varying the ventilation in the room, when the room was the coolest and the largest percentage of water was being condensed in the tubes of the stove the larger was the volume of air passing through the room, and specially over the open dish, as the main current of air would be an upward one from the stove. Consequently, the cooler the room the greater would be the evaporation of the water from the dish beneath the stove. When it might have been expected that because the temperature of the room had decreased the amount of water would have increased, it was found that no regular variation occurred. Although the water in this dish contained much of the condensed acids, the evaporation of this water would hardly affect the percentage of sulphur condensed, as the acids would remain in the residual liquor.

Another point of interest that was touched on was the extent to which the iron of the stove was corroded or dissolved away by the products of combustion in the stove. From column J it will be seen that for every 100 cubic feet of gas burnt the amount of iron dissolved and found in the condensed water as the ferric oxide, both as a solid and in solution, varied between 7.47 and 5.33 grains. The inner surface of the tubes, after prolonged oxidation, tended to scale. Both of these points have an important bearing on the life of the stove. Hygrometric measurements were taken over a few of the experiments; and it was found that, at normal temperatures, although there was more moisture actually present in the room while the stove was working the degree of saturation slightly decreased.

Summary.

The amount of the sulphur acids condensed in the type of "radiator" under examination varies with the temperature of the room. At normal temperatures (60° Fahr.) this amounts to about 30 per cent., leaving 70 per cent. to pass into the atmosphere. There is a slight drying of the atmosphere, although the actual amount of water vapour present is largely increased. No trace of carbon monoxide was ever found in the products of combustion. The room was well ventilated; and under these conditions no ill effects were experienced by those present, except during the first three experiments when the smallest amount of ventilation was maintained. The amount of iron dissolved from the inner surface of the "radiator" tubes varied from 7.47 to 5.33 grains per 100 cubic feet of gas burnt.

* Abstract from second report of the "Gas Heating Research Committee" appointed by the Institution of Gas Engineers in conjunction with the University of Leeds.

THE Art Gallery Committee of the Manchester Corporation have made a collection of lantern slides of works of art, which they are prepared to lend, free of charge, to local societies, schools, and institutions. The slides include examples of the works of many great artists of the chief schools of European painting, as well as of sculpture of Classic, Renaissance, and modern times, so that lecturers will find the collection convenient for illustrating a wide range of subjects connected with the history of art. The committee will also welcome applications from such societies for lectures or familiar addresses in the City Art Gallery, either upon the permanent collection or upon the subjects contained in the list. These lectures will be arranged free of charge.

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Berliner Architekturwelt.*

FIRST PRIZE COMPETITION DESIGN FOR CHURCH AND ACCESSORY BUILDINGS FOR ST. JAMES'S PARISH, BRUNSWICK.—Herren Joh. Kraaz & Herm. Fleck, Architects.

A STUDY OF BASE AND BEARING PLATES FOR COLUMNS AND BEAMS.*

By N. Clifford Ricker, Professor of Architecture, University of Illinois.

I.—Introduction.

THE primary object of this study has been to produce a series of accurate formulas and tables for the different forms and materials of base and bearing plates. These formulas are required to be as simple and as easily applied as possible and to be in accordance with the local building ordinances of the larger cities in the United States.

A secondary purpose has been to devise a smiilar series of formulas based on the common theory of the fracture of such plates, and to check the accuracy of these common formulas by experimental tests of a series of plates designed in accordance with such formulas. A number of typical plates were so designed and tested in 1907 by Mr. C. R. Dick, B.S. in Architectural Engineering, and the results were discussed in his thesis.

Up to the present time, very little study of theory and no experimental research appear to have been devoted to these plates. Even the German writers usually give incorrect theories with formulas based thereon, formulas which give erroneous dimensions of base plates.

II.—Limit of Safe Pressure of Plate on Masonry.

The maximum safe pressure of the plate on the masonry beneath it varies greatly, according to the nature and the resistance of this material; the requirements of the city building ordinances also differ considerably for the same kind of masonry. These requirements seem to be based upon local customs and not on actual experimental tests. Examples of such maximum safe pressures are here quoted from the ordinances of New York, Chicago and Washington, D.C., selected as representative cities, and these are further compared with the values given in Kidder's Pocket Book. (Table 1.)

Therefore this maximum safe pressure of the plate on masonry appears to vary between 70 and 1,000 lbs. per square inch, the larger value being allowed for truly dressed large blocks of stone. The value to be employed must be taken in accordance with the local building ordinance.

* From a publication by the University of Illinois Engineering Experiment Station.

Table 1.

Safe Pressures on Masonry in Pounds per Square Inch.

Masonry.	N.Y.	Chicago.	Washington.	Kidder.
Granite	—	173.61	1000–2400	1000
Limestone	—	173.61	700–2300	—
Sandstone	—	173.61	400–1600	400–700
Dimension stone, rough	—	138.89	—	—
Rubble in Portland cement	138.89	—	140	150–200
Rubble in natural cement	111.11	—	111	—
Rubble in cement and lime	97.22	—	97	—
Rubble in lime	94.44	—	70	—
Brickwork in Portland cement	208.33	173.61	250	150–250
Brickwork in natural cement	—	125	208	—
Brickwork in cement and lime	159.72	—	160	—
Brickwork in lime	111.11	90.28	111	100–120
Concrete in Portland cement	208.33	173.61	208–230	200
Concrete in natural cement	111.11	—	111–125	—

III.—Maximum Safe Fibre Stress in Metal of Plate.

This maximum fibre stress in lbs. per square inch occurs at either top or bottom of a plate of uniform thickness, or at the bottom of a cast-iron plate of tapered thickness. It must not exceed the intensities given in the following table, which are almost uniformly adopted throughout the United States:—

Table 2.

Maximum Safe Fibre Stress in Plates.

Metal.	N.Y.	Chicago.	Washington.	Kidder
Steel, compression	16,000	16,000	16,000	16,000
Steel, tension	16,000	16,000	16,000	16,000
Wrought iron, compression	12,000	12,000	12,000	12,000
Wrought iron, tension	12,000	12,000	12,000	12,000
Cast iron, compression	16,000	10,000	16,000	—
Cast iron, tension	3,000	2,500	3,000	—

Evidently the maximum tensile stress in cast iron permitted in Chicago might safely be increased from 2,500 to 3,000 lbs. per square inch, which is permitted in about one-half the cities in the United States.

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MODERN EUROPEAN ARCHITECTURE.

GERMANY.



[From *Berliner Architekturwelt.*

SECOND PRIZE COMPETITION DESIGN FOR CHURCH AND ACCESSORY BUILDINGS FOR ST. JAMES'S PARISH, BRUNSWICK.—Herren Joh. Kraaz & Herm. Fleck, Architects.

IV.—Common Formulas.

The ordinary formulas for base plates are usually empirical (Kidder), or they are otherwise based on the theory that the line of fracture of a base plate is a straight line tangent to the exterior of the foot of the column standing on the plate (Kohnke). In accordance with this theory, a series of formulas was deduced and later published in the Handbook of the Chicago Architects' Business Association. The essential formulas are the following:—

A.—For Steel Plates of Uniform Thickness.

Let p = maximum safe pressure of plate on masonry in lbs. per square inch.

k = perpendicular distance in inches from column to edge of plate.

t = thickness of plate required, in inches.

(*a*) For square plates (fig. 1).

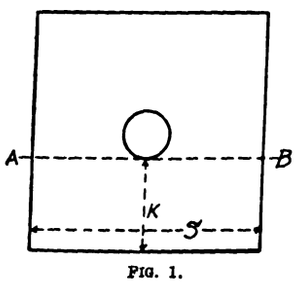


Fig. 1.

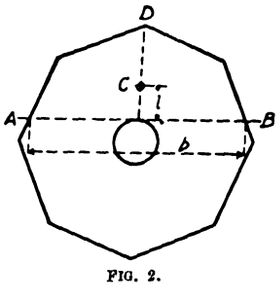


Fig. 2.

The line AB (fig. 1) is the theoretical fracture line.

Then $$t = \frac{k}{40}\sqrt{\frac{p}{10}} \qquad ()$$

(*b*) For octagonal plates (fig. 2).

The segment ADB may be divided into triangles, when its centre of gravity C is easily found by graphical methods. (See Graphic Statics.)

Let l = perpendicular distance in inches from C to line of fracture AB.

b = length in inches of line of fracture.

a = area in square inches of the segment ADB outside the line AB.

Then $$t = \frac{1}{40}\sqrt{\frac{3}{5}\frac{apl}{b}} \qquad (2)$$

(*c*) For circular plates (fig. 3).

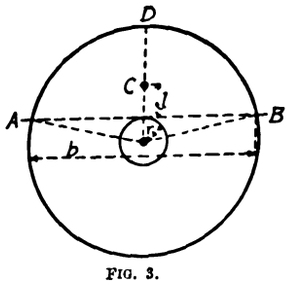


Fig. 3.

Join the ends A and B of the chord fracture line with the centre O by the radii AO, OB, and draw OD perpendicular to AB.

Let β = angle AOB in degrees between radii AO, BO.

A = area in square inches of the entire circle of the plate.

b = length in inches of chord fracture line AB.

R = external radius of end of column in inches.

Then $\frac{A\beta}{360}$ = area of the sector $ADBO$ in square inches.

$\frac{bR}{2}$ = area in square inches of triangle ABO.

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Hence $\frac{A\beta}{360} - \frac{bR}{2} = a$ = area in square inches of segment ADB.

Also $\frac{b^3}{12a}$ = distance in inches from centre O to centre of gravity C of the segment.

Hence $l = \frac{b^3}{12a} - R$ = perpendicular distance in inches from C to chord line of fracture AB.

Finally, $$t = \frac{1}{40}\sqrt{\frac{3apl}{5b}} \qquad (3)$$

(To be continued.)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) continues the series of illustrated articles by Mr. Stapley on the "Origin and Development of Furniture," dealing now with sixteenth-century work in Italy, France, and England. The principal plates illustrate small and moderate sized houses, the most important work of the year of the students of the Society of Beaux-Arts Architects, and the application of architectural design to such utilitarian structures as Municipal Gate House and Shelter, Cobb's Hill Reservoir, Rochester, N.Y.; a warehouse in Buffalo, N.Y.; and a warehouse and mill, Philadelphia.

La Construction Moderne (Paris) illustrates the museum of the Chamber of Commerce of Dunkirk, of which M. J. Morel is the architect, whose design is a typical example of refined modern French architecture, and a water fountain basin symbolising the Seine and its tributaries, which was exhibited in the Salon of this year, and is the work of the sculptor, M. Larche.

Zodtchy (St. Petersburg) has a leading article on English garden cities principally treating of Letchworth, but with illustrations also of houses at Darlington and Haslemere.

Engineering Record (New York) contains an account of the new building of the John Schmalz Sons' bakery in Hoboken, N.J., which is noteworthy as an instance of the adoption of reinforced concrete for the upper part with steel columns in the lower storeys. There is included an interesting account of a series of tests made at the Massachusetts Institute of Technology on the corrosion of iron embedded in concrete, with special reference to electrolytic action. From the *Schweizerische Bauzeitung* our contemporary gives a description of a building foundation in ground disturbed by a tunnel through the morain beneath the high promenade in Zurich, the building being a private residence over the wall of the tunnel.

Correspondence.

[The Editor will not be responsible for the opinions expressed by Correspondents.]

A Further Open Letter to Sir Aston Webb, C.B., R.A., F.S.A., F.R.I.B.A.

SIR,—The able letter with the valuable suggestions of your correspondent "L." deserves the particular attention of those responsible for the ridiculous waste in connection with public competitions. It is with a feeling of sadness that I visit the exhibited drawings after one of our most important competitions and see the work which has been expended in producing some of the drawings sent in, and all to no purpose. May I be permitted to suggest a form for competition somewhat on the following lines? For an open competition, plans and plans only in the preliminary stage. From these, four architects to be selected to compete finally, who will then prepare their full set of drawings, the three rejected ones dividing the premium, say, of 200*l.* or 250*l.* I am sure that such an arrangement would work capitally, would give a maximum amount of satisfaction, and would I suggest give equal satisfaction to an assessor.—I am, &c.,

M.

The Proposed Coinage.

SIR,—I am sorry not to be able to agree with your correspondent, Mr. W. F. Potter. I consider the coinage of our late revered Monarch, King Edward VII., was a great advance, and far superior to that of Her late Majesty Queen Victoria. The lion shilling of Edward VII. I consider to be one of the most handsome coins ever issued in this or any other country. Our present-day style of costume does not lend itself to reproduction. Fancy King George in hideous headgear of top hat with the regulation frock coat; can anyone suggest or imagine anything uglier? If Mr. Potter's suggestion be carried out may it please His Majesty to be portrayed in naval uniform. Possibly this latter suggestion may be worthy of consideration. The medal printed in Mr. Potter's letter of John Duke of Argyll and Greenwich is, however, most interesting, and from the reproduction must evidently be in a perfect state of preservation.—I am, Sir, your obedient servant,

London: August 22, 1910. A WEE MITE.

The Great Fire at the Brussels Exhibition.

SIR,—Some time ago you favoured me by publishing a letter of mine, "A New System of Building." In this system I pointed out its absolutely fire- and damp-proof qualifications, also its cheapness and the rapid erection of buildings. It would be especially suitable for exhibition buildings such as above, where valuable works of art and inflammable materials were exhibited. The destruction of these invaluable works is a calamity which no insurance can cover. However, it is no good "locking the stable door after the steed has been stolen." There is some talk of re-erecting the parts destroyed by the fire, and it is to be sincerely hoped that the responsible authorities will consider the necessity of these exhibition buildings being constructed in fireproof materials.—Yours obediently,

HENRY H. B. SANG,
August 20. Architecte-Décorateur.

R.I.B.A. Town Planning Conference.

SIR,—Owing to recent legislation a new era of town-planning and reconstruction is about to open in the United Kingdom. That there is no danger of the legal and public health aspects of the question of receiving inadequate attention is already clear. But it is equally important in the interest of our own and future generations alike, that the artistic side of such improvements, with its lasting result in beauty and convenience, be not less fully and authoritatively considered.

With this object the Council of the Royal Institute of British Architects have made arrangements to hold an International Town-planning Conference, of which His Majesty the King has graciously consented to be patron, on a comprehensive scale in the second week in October, and we are glad to state that we are already assured of the participation and assistance of many of the most distinguished experts on the subject not only of our own country, but of Europe and the United States, as well as of others from the overseas Dominions of the Crown.

By an act of disinterested generosity on the part of the president and members of the Royal Academy, the Galleries at Burlington House have been placed at the disposal of the Royal Institute, for the display of the notable designs and illustrations of town-planning and re-modelling which have been collected from all parts of the world.

In order that the proceedings of the Conference may be of the widest utility and that the welcome offered to our numerous foreign guests may be of the most representative character, we desire by your courtesy cordially to invite the presence and co-operation of all those who are concerned in order to secure the best results from a movement of not merely local, but national, and even imperial importance.

Forms of membership with all particulars may be obtained from the Secretary of the Royal Institute.—We are, Sir, your obedient servants,

JOHN BURNS, Honorary President of the Conference.
LEONARD STOKES, President.
ASTON WEBB, Chairman of the Executive Committee.
JOHN W. SIMPSON, Secretary-General.
August 24, 1910.

THERE have just been erected at Coombe Abbey a pair of fine wrought-iron gates, of Italian make, and dated 1588. They were discovered in Italy. The pair now form an additional entrance to the kitchen gardens at Coombe.

THE new offices of the Society of Architects at 28 Bedford Square, W.C., are now open for business purposes, but the members' rooms (reading rooms, &c.) will not be available for use until after the annual general meeting in October, notice of which will be given in the journal.

A LOCAL Government Board inquiry was held on Tuesday at Grimsby with reference to an application of the Corporation to borrow 840*l.*, and to appropriate certain land in Victoria Street, for the purpose of extending the public library. Mr. Edward Leonard, P.A.S.I., conducted the inquiry. Mr. J. G. R. Baxter, assistant borough engineer, submitted plans and estimates of the scheme.

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The Architect.

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FORTHCOMING EVENTS.

Monday, September 5.

Royal Sanitary Congress: Twenty-fifth Congress opens at Brighton.

ANNUAL REPORT OF THE BRITISH MUSEUM.

ALTHOUGH the total number of visitors to the British Museum in 1909 was lower than in 1908, being 708,836 as against 743,413, it was higher than in 1907, for which year the figures were 646,300. The year 1908 was exceptional, in that a large number of visitors were attracted to London by the Franco-British Exhibition, but even the attendance of that year was far below the 954,551 of 1904 and the 813,659 of 1905.

There was a gratifying increase of the number of students in particular departments (other than the reading-room), from the 55,676 of 1908 to 58,065 in 1909.

As regards structural progress, work was resumed on the extension building early in the year, and the report states that the contract date for the completion of the building is January 31 next year. The work of constructing fireproof partitions in the roof of the Museum has been continued, and progress has been made with the replacing of decayed stones in the outer walls of the building. The temporary iron building erected to contain the casts of antique sculpture transferred from the Victoria and Albert Museum was completed and opened to the public on August 23.

Acquisitions of special interest in the Department of Printed Books include one hundred and twenty-seven English books printed before 1640 and sixty-six incunabula (books printed before the year 1501).

Amongst the acquisitions in the Department of MSS. we may note a MS. copy of EDWARD FITZGERALD'S translation of the Rubáiyát of OMAR KHAYYAM, beautifully written by the late WILLIAM MORRIS in 1872, and decorated by him with fine illuminated borders, the figures in which were partly designed by him and partly by Sir E. BURNE-JONES, and were painted in by Mr. C. FAIRFAX MURRAY. Another interesting addition to the Department of MSS. is a number of water-colour drawings by JOHN BUCKLER, of Lacock, Malmesbury, and Fountains Abbeys, an ancient house at South Petherton, Somersetshire, and West Firle Church in Sussex. Also "Time-books," with rough sketches and descriptions of churches and other buildings of THOMAS RICKMAN, architect, author of the "Styles of Architecture in England," with a volume of sepia drawings of churches, &c. Other acquisitions to be noted are "Assessment for the Repair of Godmersham Church, co. Kent, 1618," and "Deeds (6) relating to Wroxton Priory, co. Oxon, &c., 13th to 17th centt."

The Department of Prints and Drawings has acquired an etching by LAURA PIRANESI, "Veduta del Tempio di Bacco"; a drawing by JOHN FULLEYLOVE, "The Portcullis in the Bloody Tower"; a drawing by JOHN RUSKIN, "The Castle Rock, St. John's Vale"; a drawing by ALFRED STEVENS, "Design for Decoration of the British Museum Reading-room"; a drawing by RICHARD WILSON, R.A., "Ruins of the Amphitheatre at Capua"; etchings by FRANK MILTON ANNINGTON, "Eleven Plates of Old Buildings in Bruges, Paris, Nuremberg, and Rothenburg"; etchings by CAROLINE HELENA ANNINGTON, "Five Plates of Subjects from Bruges and Paris"; etchings by HENRY WINSLOW, "Twelve Subjects from Towns in France"; and the "Flower-book" of Sir E. BURNE-JONES, containing thirty-eight drawings in water-colours, heightened and enriched with gold, and four unfinished pencil outlines of designs, composed as roundels, of symbolical or fanciful illustrations of the names of flowers.

The principal acquisitions of the Department of Egyptian and Assyrian Antiquities were a black granite seated figure of an official of the fourth dynasty; two fine statues of officials of the Court of Queen HATSHEPSET; a seated statue of a tribal chief of about 1,200 B.C., with gold mask, crown, chain, &c.; and a foundation-cylinder from the palace of SENNACHERIB, containing the longest inscription of the king yet discovered, with much interesting historical information, including a full account of the building operations of SENNACHERIB, and describing the improvements which he made in the city of Nineveh. The area of the city was more than doubled, fine gardens were made, and the water supply was greatly improved. SENNACHERIB devised a complete system of fortification for the city, and he built fifteen gates, seven facing south-east, three north, and five south. The whole city was surrounded with two walls, each being of immense strength and thickness. The names and positions of these gates are made known by the new cylinder for the first time. A fine fragment of another cylinder is inscribed with the annals of SENNACHERIB from B.C. 705 to B.C. 681, and describes the building of the royal palace at Nineveh and the transport of cedar beams from Mount Amanus and Mount Sirara in the Lebanon. Of architectural interest is the acquisition of a solid bronze ornament of an Egyptian temple door in the form of the head and bust of a goddess wearing a tiara of flowers or serpents. This is of the Græco-Roman period.

In the Department of Greek and Roman Antiquities the most important fact of the year is a rearrangement of the sculptures of the west pediment of the Parthenon, by which the existing fragments are grouped more nearly at their proper relative heights and angles, which is still in progress. Of acquisitions in this department the principal is a gold necklace composed of eight plaques, each stamped with a design of Victory driving a two-horsed chariot, and fifteen oval beads stamped with double palmettes; each plaque was originally hung from two beads. This is Greek work of the fourth century B.C. Next in importance to this are a head of DIONYSOS of Scopaic style, perhaps Greek work of the fourth century B.C., and a portrait head of the Emperor TITUS from Utica.

The Department of British and Mediæval Antiquities has received presents of three large and very important collections, namely, the Greenwell collection of Bronze Age antiquities, presented by J. PIERPONT MORGAN, Esq.; the Falcke collection of Wedgwood ware, presented by ISAAC FALCKE, Esq., and Mrs. FALCKE; and a very important and well-preserved series of 250 pottery vases from ancient graves in Peru, presented by H. VAN DEN BERGH, Esq.

The donation by Mr. PIERPONT MORGAN completes the British series and fills most of the gaps in the foreign section exhibited in the Bronze Age room. During half a century Canon GREENWELL acquired nearly 2,500 speci-

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mens of bronze. The majority of these are now exhibited, and with the Greenwell collection of Bronze Age pottery, comprising more than 2,000 specimens, and presented by the Canon to the Museum in 1879, constitute a most valuable store of information on the craftsmanship of the Bronze Age.

The Falcke collection of Wedgwood pottery has raised the Museum's collection of that ware from very small dimensions to the position of being probably the finest in existence. The bulk of the collection belongs to the best period of Wedgwood manufacture, namely, from 1760 to 1800, and most of it was acquired by Mr. FALCKE before 1856. Amongst the most beautiful productions of WEDGWOOD'S factory are the smaller articles in coloured jasper wares and white biscuit, such as cameos, intaglios, portrait medallions and plaquettes, and of these the Falcke collection contains a rich series, many of them set in facetted steel or mounted in writing-boxes, clocks, watches, snuff-boxes, étius and châtelaines, illustrating the uses for which these dainty objects were designed.

The designs of JOHN FLAXMAN are well represented, and include proofs of two important bas-reliefs and of a number of portrait medallions, besides a few original waxes. Other artists whose designs are represented are Lady TEMPLETON, Miss CREWE, Lady DIANA BEAUCLERK, Mrs. LANDRE, HOSKINS, TASSIE, HACKWOOD, WEBBER, PACETTI, DAVAERE and DALMAZZONI.

The valuable collection of Peruvian pottery given through the National Art Collections Fund by HENRY VAN DEN BERGH, Esq., illustrates the remarkably high standard of artistic excellence attained by the ancient Chima potters, both as regards form and decoration.

Amongst the British mediæval objects acquired are a bronze knocker with conventionalised lion's head and later iron ring in mouth, of late twelfth-century workmanship from Brazenhead Farm, near Dunmow, Essex; a gold finger-ring with emerald in octagonal bezel of thirteenth-century date, found in Cloak Lane, London; and a brass astrolabe, dated 1326, with separate plates for the latitudes of Oxford, Paris, Montpellier, Rome, Jerusalem, and Babylon, remarkable for its unusually early date as a European example and for the high quality of the workmanship. Of minor importance but interesting architecturally is a brick incised 1393, found built into a wall at Ditchingham, Norfolk.

NOTES AND COMMENTS.

THERE will be an important architectural and building competition in connection with a Town-Planning and Modern House and Cottage Exhibition which is to be held next summer at Gidea Park, Squirrels Heath, where a town-planning scheme was recently inaugurated by the President of the Local Government Board, the Right Hon. JOHN BURNS. Mr. H. H. RAPHAEL, M.P., who some years ago presented to Romford the fine public park which bears his name, has offered a thousand guineas in prizes for the best-designed houses and cottages erected in the Exhibition, and for a site plan and other designs. The gold medal of the Exhibition and 250*l.* will be awarded for the best detached house, the building cost of which is not more than 500*l.* There will be a second prize of 100*l.* Another gold medal and 200*l.* will be given for the best cottage, the cost of erecting which is not more than 375*l.* In this class there will also be a second prize of 100*l.* Prizes of 50*l.* are offered for the house and cottage best fitted and planned to economise work and service. For a town plan of Gidea Park, in which the houses and cottages are to be built, there are prizes of 100*l.* and 50*l.* There is also a competition open to builders for excellence of workmanship and construction, in which a gold medal and prizes of 100*l.* and 50*l.* will be awarded. Prizes will also be given for garden design and perspective drawing.

MR. GUY DAWBER, the Vice-President of the Royal Institute of British Architects, Mr. H. V. LANCHESTER, F.R.I.B.A., and Mr. MERVYN MACARTNEY, F.R.I.B.A., F.S.A., will act as judges. Designs must be submitted not later than October 31. The full conditions can be obtained on application to the Secretary of the Town-Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C. The Romford Garden Suburb adjoins the Squirrels Heath and Gidea Park Station on the Great Eastern main line, which will be opened in December.

To assist property owners in the almost impossible and quite bewildering task of filling up Form No. 4 with the information upon which the State is to base the Original Valuation, under Section 26 of the Finance Act, 1909-10, of all land in the United Kingdom, the Land Union has issued at the low price of sixpence a guide which is certainly useful and helpful, giving advice on several points that might easily be overlooked by the unfortunate owner to his serious detriment. Naturally the brochure does not pretend to finality, for at present no one knows what the Finance Act means, not even Mr. LLOYD GEORGE, inasmuch as he, in the House of Commons, refused to throw any light upon the incidence of the Undeveloped Land Duty on the ground that it might eventually have to be decided in the courts. That is to say, all that the presumptive author of the Act knows is that it is a promising hot-bed of litigation.

SOME important and far-reaching effects of the new land taxes are pointed out in the pamphlet. The value of all the land of the country was depreciated on the passing of the Act by an amount equal to the capitalised value of the land taxes. But this depreciation must not be taken into account in filling up Form No. 4 for the depreciation accrued after April 30, 1909, which is the date fixed by the Act as on which the original value of the land is to be estimated. The expression "land" includes all buildings and other structures thereon and all minerals on, in or under the surface of the land. Many owners of property have solaced themselves with the idea that as leaseholders they will not be troubled with the bugbear of Form No. 4, but the Act provides that holders of leases having more than fifty years to run are to be treated as owners.

THE ninetieth annual meeting of the British Association for the Advancement of Science opened on Wednesday, and in addition to the papers on a variety of scientific subjects and visits to several of the most important factories of Sheffield, there have been arranged a number of excursions to places of architectural and artistic interest. The principal places to be visited are Chatsworth and Haddon Hall, Welbeck and the Dukeries, Hardwick and Bolsover Castle, Clumber and Rufford, and the Derwent Valley waterworks.

ST. PAUL'S Cross, erected in the churchyard of St. Paul's Cathedral, from the designs of Mr. REGINALD BLOMFIELD, A.R.A., some distance west of the ancient octagonal open-air preaching cross, dating back to the middle of the thirteenth century, which was reconstructed by Bishop KEMP in the middle of the fifteenth century, and demolished by order of the Long Parliament in 1643, is completed, and the unveiling ceremony will take place after the Long Vacation. The new monument differs very materially from the original, and is in the Renaissance manner to harmonise with the architecture of WREN'S masterpiece. The late Mr. H. C. RICHARDS, K.C., M.P., bequeathed the sum of 5,000*l.* for the re-erection of the memorial.

THE *Liverpool Courier* having published an illustration of Whittingehame, Mr. ARTHUR BALFOUR'S Scottish house, with a descriptive and historical article, Professor C. H. REILLY writes as follows to the *Courier*:—"I am not acquainted with Whittingehame, Mr. BALFOUR'S Berwickshire house, except from the well-known view you publish to-day, but from that alone it is, I think, a grave mistake of your correspondent to say that the building owes little to architectural graces. Before I had read his article I had been impressed with the fine composition and simple dignity of the house—a fit house for a statesman—

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and I afterwards looked through the article chiefly to find whether the name of the architect was given. If it is by SMIRKE, and I can readily believe it to be, it was designed by one of the most scholarly of our early nineteenth-century artists, whose refined work, neglected during the sentimental late Victorian period we have just passed through, is beginning again to receive its proper recognition. SMIRKE was not the architect of the Royal Exchange, London, as your correspondent states. His best-known work, which in any other country would receive a nobler setting, is the British Museum, a building containing some of the finest rooms in Europe, notably that devoted to the Halicarnassus monument."

FROM the calendar of the Glasgow and West of Scotland Technical College for the ensuing session we learn that a diploma course in building has been instituted to afford the special and necessary training required by students proposing to become masters in any of the building trades or to hold positions such as managers of building works, clerks or masters of works, measurers, quantity surveyors, estate factors, and the like. Thus the course is not intended for those who desire to become architects, but for the captains of labour who will direct the actual carrying into execution of the architect's designs.

THE course extends over three annual sessions, in the first of which the instruction is scientific and the same as for civil engineers, including natural philosophy, mathematics, chemistry, physics, and engineering drawing. In the second and third years the study becomes more technical and embraces mechanics, building construction, carpentry, joinery, masonry, practical geometry, and architectural drawing with builder's quantities and building superintendence. As the course leads to a diploma a good general education is required before its commencement, and an entrance examination equivalent to matriculation at the Scottish Universities must be passed. A good provision in the diploma course is that at least six months must be spent on building works before the end of the course. The scheme seems to us admirably adapted for the education of the master builder.

FOR architects the Glasgow School of Architecture continues to provide partly at the Technical College and partly at the School of Art a diploma course and a certificate course. The former requires study in full-day courses for four years with attendance in an office during the vacations, or an alternatively arranged course partly of day classes and partly of evening classes. A certificate can be obtained after five sessions of attendance at evening classes for the senior certificate or three sessions for a junior certificate, in each case subsequent to the passing of an entrance examination.

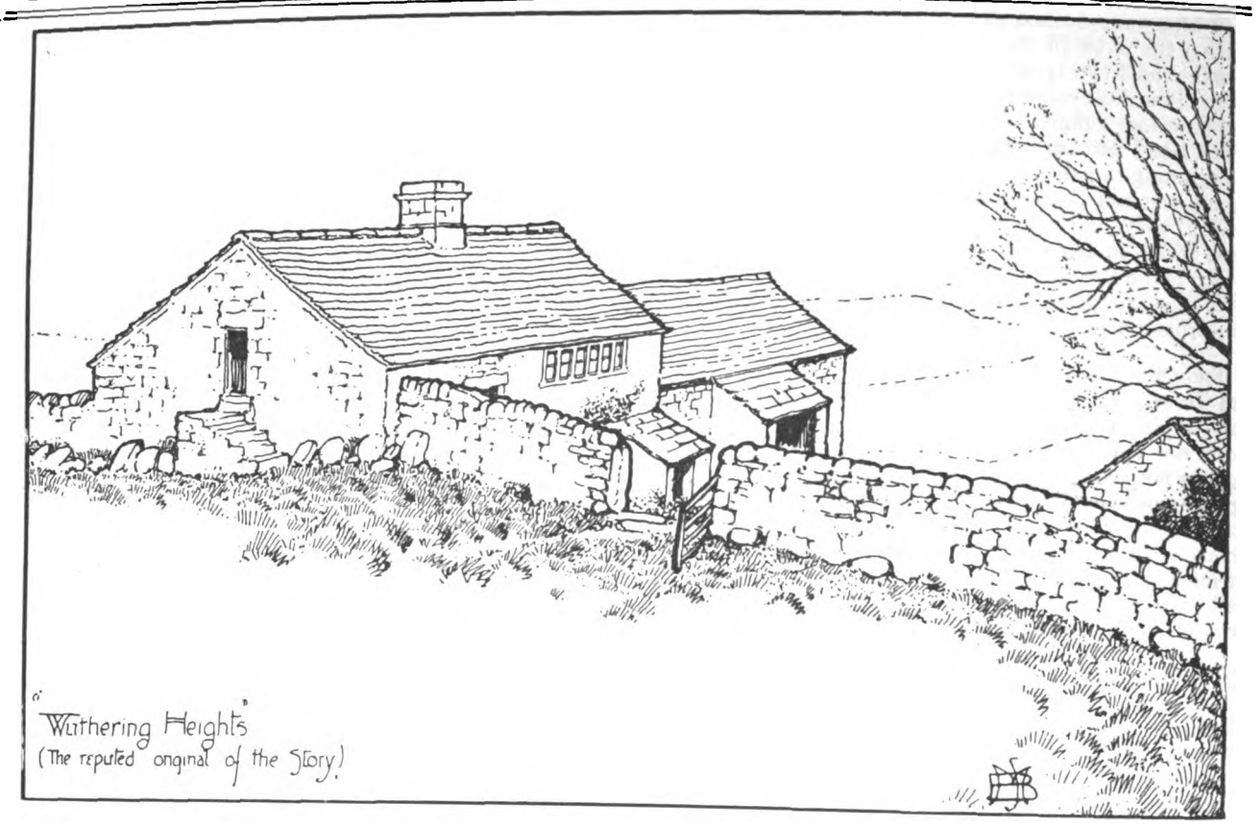
IN connection with the present vacation lectures at Edinburgh University Mr. DAVID MACRITCHIE, F.S.A., delivered an illustrated lecture on "Cyclopean Structures in Scotland." Mr. MACRITCHIE explained that the use of the term "Cyclopean" was applied by general consent to a certain order of architecture, very rude and primitive in its character, the chief features of which were the use of huge blocks of stone, often unhewn; the absence of cement or mortar; the great thickness of the walls, admitting of passages or galleries without any detriment to the structure; and the use of the so-called "false arch" in place of the voussoir arch. This "false arch," formed by making the upper courses of the walls approach nearer and nearer in their ascent until they were bound by heavy roof-flags, was an invariable feature of Cyclopean architecture. All these characteristics were found in the pre-Hellenic structures of Greece. Buildings of the same kind were found, moreover, throughout the Mediterranean countries, from Egypt and Asia Minor to Spain. The most prominent of the Cyclopean structures found in Scotland were the round towers generally known as "brochs" or "doons," which approximated very closely to the *talayots* of the Balearic Isles and the *nurags* of Sardinia. The best existing specimen was the Broch of Mousa in Shetland. Of those which were still instructive, although in a ruinous condition, a good example was the Doon of Carloway in Lewis. In all respects the architecture of these towers was of the construction known as "Cyclopean." Closely connected with the brochs or doons were the chambered mounds and underground galleries, the latter being akin to the *allées couvertes* of France. These show various forms of transition from the above-ground structure to the actual souterrain. An interesting comparison was made by the lecturer between certain underground dwellings in the Balearic Isles, in Orkney, and in the Outer Hebrides, wherein the area capable of being roofed over was considerably increased by the use of pillars and piers. In referring to the probable age of the Cyclopean structures of Scotland the lecturer deprecated the application to them of the term "prehistoric." Dr. JOSEPH ANDERSON'S estimate that the brochs were probably built between the fifth and ninth centuries of their era accorded well with the Norse chronicles, which ascribed such buildings to the Picts at the time of the Norse colonisation of Orkney in the ninth century. Moreover, there were three "souterrains" in the south of Scotland which had been partly built from Roman ruins, and in several instances vessels of Samian ware had been found in underground abodes of the same class. Their period was therefore within the Christian era, certainly in some cases, and possibly in all.

THE supply of genuine antiques being insufficient to meet the demand especially by travelling Americans, the manufacture of spurious antique furniture and other curios is a flourishing industry, and a German illustrated paper has recently admitted that in the Fatherland this industry is in full swing. Antique sculptures, pictures, coins, and furniture are daily being produced to meet the demand of the globe-trotter, and details of the faking processes have been described by the German periodical. The industry is not confined to Germany. Many quaint cottages in rural England are furnished with grandfathers' clocks, chairs, tables, chests, and other antiques of the present century, and Birmingham is credited with an extensive manufacture of new-old metalwork.

AT a recent meeting of the Hampshire Field Club and Archæological Society at Old Sarum, the exploration of which will, it is estimated, occupy a term of ten years, at an expense of 600*l.* a year, Mr. ST. JOHN HOPE explained the works in progress, and then conducted the visitors round the excavations, stopping at several points and delivering a brief address on the character of the buildings whose foundations had been laid bare, and the extent of which were a surprise to many. Special reference was made to the great tower or keep of the castle, and he added that the stone ashlars facing the walls were for the most part removed to Salisbury and used in the cathedral works there. A visit was also paid to the museum, which contains many interesting architectural fragments, and quantities of broken pottery, almost all of mediæval date, together with various iron objects such as keys, spurs, and tools, and a few of bronze or latten. The latter include a charming little pendant of early thirteenth century work, pounced with a fleur-de-lis. There is also nearly a yard's length of gold lace. All antiquities and objects of interest found are the property of the Dean and Chapter of Salisbury, and it has been decided they shall be preserved in the city itself.

EARLY in September there will be issued to the public a volume giving the results of the labours of the Royal Commission on Historical Monuments as regards the county of Hertfordshire, and dealing with (1) Prehistoric monuments and earthworks, (2) Roman monuments and Roman earthworks, (3) English ecclesiastical monuments, (4) English secular monuments, (5) unclassified monuments. The English secular class includes, in addition to dwelling-houses, all such earthworks as mount and bailey castles, homestead moats, &c. We anticipate that the work will be of exceeding value to students of architecture as well as to archæologists.

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THE SPIRIT OF THE DALES.

AN ESSAY ON YORKSHIRE HOUSES.

IT is fifty years ago since "Currer Bell," introducing a new edition of her sister's "Wuthering Heights" to a public appreciative only after Emily Brontë's death, and then perhaps only because of the glory reflected from Charlotte's name, wrote these words of the readers to whom she appealed:—

"The wild moors of the North of England can for them have no interest; the language, the manners, the very dwellings and household customs of the scattered inhabitants of those districts must be to such readers in a great measure unintelligible and—where intelligible—repulsive."

But in half a century the times have changed; Charlotte and Emily indeed have done something to make the dales of Yorkshire known, to turn the tourist northwards as August brings his annual release. And since railways have spread a network of facilities round the moors, much of the savagery and superstition which haunts the morbid pages of Emily's clever fancy have evaporated with the dawn of civilisation.

But just as a glamour of its own hangs over Hardy's Wessex, just as a memory of the hills and seaboard of Galloway lingers long in the mind of all who have revelled in Crockett's stirring tales, so ever since the rough times pictured by those lonely girls writing in their bleak parsonage at Haworth many English folk must have fancied and felt the mysterious spirit of the dales.

In these days of travel books when topography may be such light and easy reading it is not likely that Yorkshire would escape the tramping journalist's pen. So we have had Yorkshire as a whole and Yorkshire in instalments, Yorkshire from a bicycle and Yorkshire from a six-cylinder car, Yorkshire in black and white and again in the three-colour process—a very surfeit of books about the county of broad acres, in all languages from English to American.

Yet it seems to me that an essential difference has been ignored. Yorkshire is not one county in reality, but three at least. There are real and very vital differences between, say, a Craven shepherd and a Sheffield blade, between a Leeds "loiner" and a farmer from the Wolds.

To any man who knows the county well there is an important line of cleavage between the dale country—the country west of Leeds and Ripon, that is—and the rest of Yorkshire.

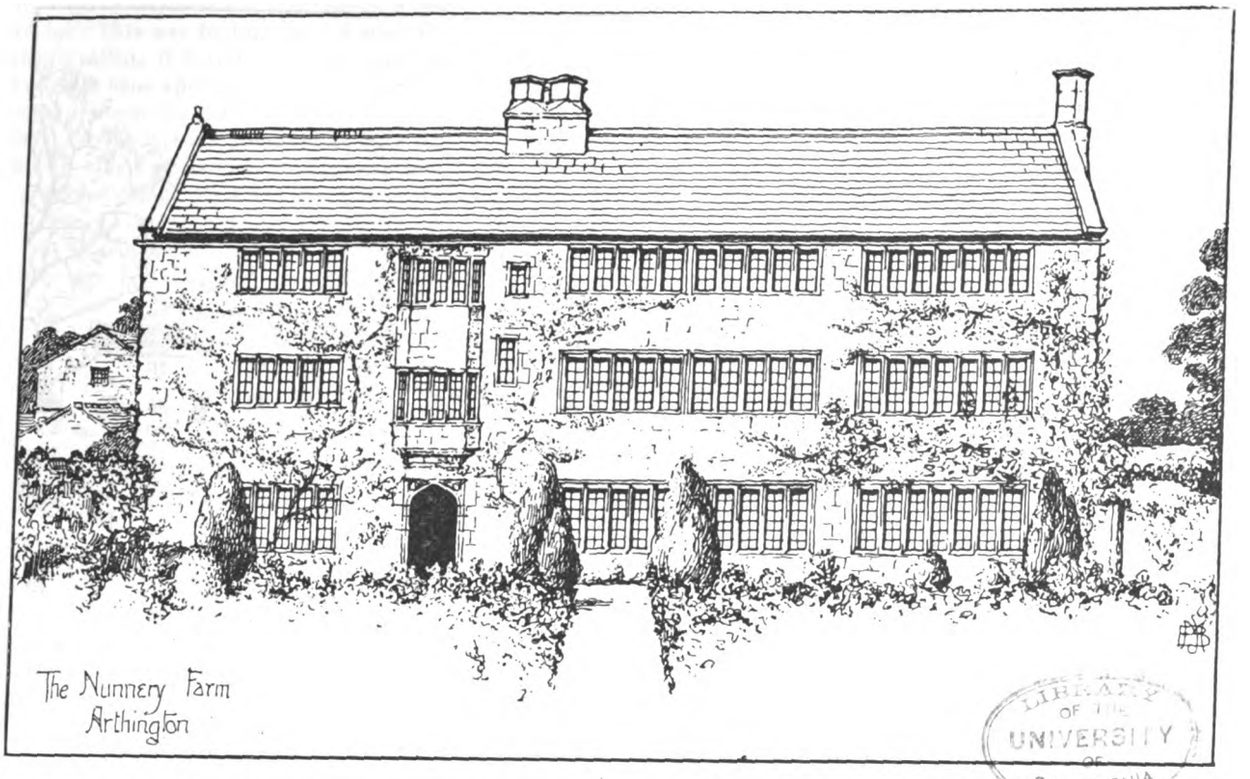
And to no man will this distinction be more apparent than to an earnest student of architecture. In the plain of York and on the Wolds, in the fishing villages and ports along the North Sea, we find the huddled tiled roofs and rich-toned brickwork which we associate with the buildings of a bygone age in many other parts of our land. But as we pass the invisible border line I have mentioned, where the low green hills rise from the plain and gradually buttress up the mighty Pennine fells, another sort of homestead is found which can be likened to no other, so far as I know, in the world.

And as architecture more than any art perhaps reflects the lives and habits of men, as in this case it has unconsciously adapted itself in character to the stern moorland scenery among which it lies, there is some excuse for considering the weather-worn stone farmhouses of West Yorkshire as the embodiment of "The Spirit of the Dales." For it is in combination—the handiwork of nature and the handiwork of man—that to me this spirit becomes apparent. On the Mendips one may see moorland stretches broken by stone walls and covered with bracken; in the Cumberland Fells and even in remote parts of Southern Italy I have seen nature just as on the wild stretches of hill round Whemside. There must be many places where one can find the scenery of our Yorkshire dales, but none where "the language, the manners and the very dwellings" portrayed by Charlotte Brontë and her sisters produce the same effect which I have ventured to christen with a possibly fanciful title at the head of this article.

Our chief concern, then, being with a little-known phase of architectural history, we will not tear it ruthlessly from its setting, for at last it is dawning on a bewildered and a forgetful public that where Ruskin and his disciples failed was in their monopoly of ecclesiastical Gothic as the only style of building in sympathy with nature. The Victorians who went to Venice to worry out the inner meaning of sculptured capitals which never had any meaning at all were the very same people who erected the most hideous and utterly inartistic houses that have ever disfigured an innocent countryside. It was Ruskin, too, who fulminated against railway stations because they annoyed him, and whose simple solution for their treatment was to make them so ugly that no man would ever enter therein.

To-day our sympathies lie not always with this favoured prophet of our fathers' time, beautiful as were his thoughts and richly as he expressed them. Sometimes we feel that he was more concerned with the absolute perfecting of some mystic theory, with ensuring that every word was in its place, just as he was concerned with the very paper his words were printed on, and that he missed the real connection between art and life. Away on the gaunt fells between Westmoreland and Yorkshire I have seen little railway stations built in the simple vernacular style of the lonely barns and farmhouses scattered around them, built with the grey stone walls and roofs familiar for centuries to the dales-

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man as his native style. These pleasant oases for a north-bound traveller, garlanded as they often are with climbing plants and flower-beds, are not the work of an inspired seer whose morocco-bound prophecies lie on drawing-room tables and whose jewelled epigrams form the food of many a high-flown discourse. They are the work of an unknown railway surveyor whom nobody reveres because he is part of a great commercial machine. Yet he too is doing his share in making our country beautiful, and it is with him a labour of love. He is not paid an extra fee for suiting his station buildings to the villages in which they lie, but he is more of a benefactor to his fellow-men than one whose fancies are only a little lower than the angels.

However, as this essay has, strictly speaking, no official connection with railway stations or angels, the last paragraph may be regarded as a digression, as a wavering from the attack on our subject at issue. Yet perhaps we may draw from them our very justification for writing at all, since it is by studying architecture of every sort in its surroundings that we most successfully avoid the mistakes of the Victorians, who regarded a house as no more than a necessary nuisance, the mistakes of those railway companies who have not the far-sightedness of some of their more cultured surveyors.

And before we proceed to a more detailed examination of the old stone houses of the Yorkshire dales, to a process of sifting and fault-finding, analysis, criticism, and what not, some further consideration of their surroundings in general may not be out of place.

To you who have never visited the dales I would say, Be careful how you approach them, for unless you are contented to regard Leeds or Sheffield as a foil to the loveliness that lies beyond, you will turn back on reaching these grimy cities, with your delicate nostrils offended by the fumes of many trades. Yet there are houses worthy of a visit between Leeds and Sheffield—there is, for instance, Heath Hall—and only a few miles north of Leeds you will find yourself at the gate of the dales.

The lower reaches of Airedale traverse a smoky region of collieries where a richly-wooded country is gradually being sprinkled with coal-pits and slag-heaps.

The lower stretches of Wharfedale, Nidderdale, Wensleydale and Swaledale, on the other hand, are part and parcel of the plain of York, and the houses found in them closely resemble in character the village architecture of a great part of rural England. Their churches are particularly fine, and with one or two exceptions are superior to the rough-hewn Perpendicular work of the upper dales.

But as we turn westwards towards the land of strong winds and hardy, weather-beaten farmers, the scenery changes, and with it the architecture. A valley, widening or narrowing, with the river flowing over a stony bed—not very rapidly yet—steep and richly wooded hills on either hand, little towns and villages where sometimes modern brick villas, alas! clash sadly with the older buildings, and at frequent intervals houses of local stone dating back to Elizabethan times.

It is partly owing to this prevalence of good stone, and partly because of their proximity to civilisation, that we find here a greater richness and grace in the designs, a certain lack of the harsh severity of examples from the wilder moors beyond.

In the highest parts of the dale country, though architecture is perhaps not of so finished a quality as round Otley and the towns half-way up these valleys, there is that rugged grandeur of aspect which is the most striking feature of the Yorkshire fells. Vast sweeps of moorland, rising in tiers of limestone or grit to some bare and prominent peak like Penyghent, a never-ceasing sound of rushing becks and rivers, beautiful woods, ferns and mountain-ash trees, and dotted about on the fellsides, or crowded into the dales, grey limestone villages.

There is here little of the whitewash so common in Cumberland and Galloway, where the scenery is in many respects similar; and it is in these grey little villages, perhaps more than in any other part of Yorkshire, that our fancy may create for us the spirit of the dales.

A land of wide moors and running water, of limestone gables and low-pitched roofs; a land, too, of storm and wind, where a hard life produces hardy men; a land where the struggle for existence is keen but healthy; such is the district which Charlotte Brontë first made famous many years ago, and which we are now going to put through the architectural mangle.

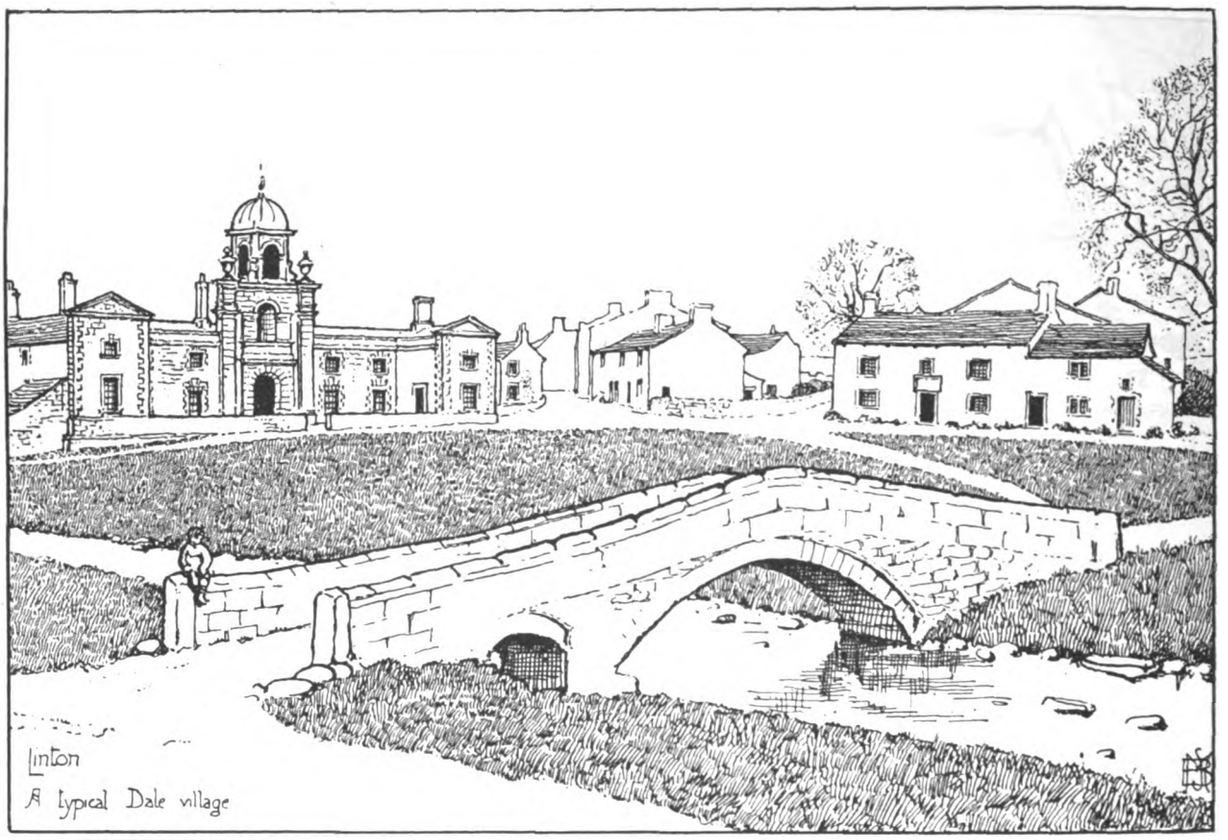
However limited the subject of "Old Stone Houses in Yorkshire" may appear at first sight, it is necessary to limit it still further to bring it within the compass of this paper and, which may seem still more strange, to define it so as to give it a character of its own.

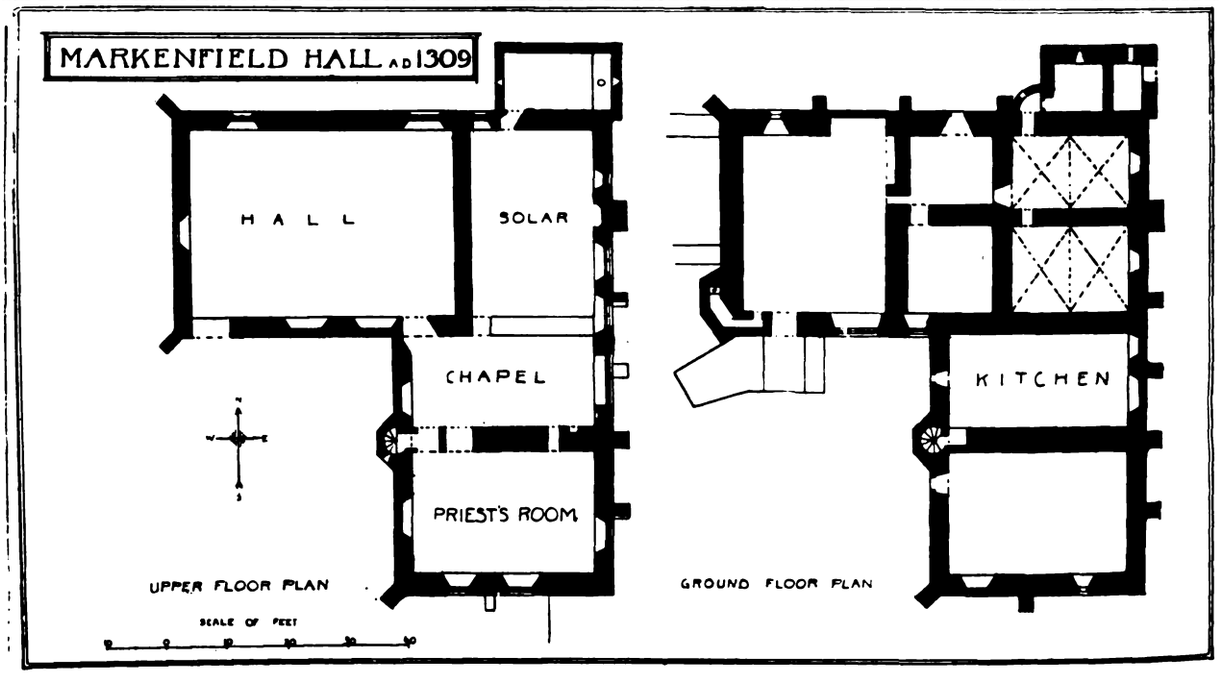
It is not my intention, for instance, to deal with anything so purely mediæval as the Abbot's House at Kirkstall, with anything so vast and aristocratic as Castle Howard, or even very much in detail with the beautiful but familiar Fountains Hall.

Each of these names is a landmark and is known to all, whereas the humble and rustic examples I shall show you have no celebrity and few appreciators.

The Yorkshire dales are by no means destitute of domestic buildings of the Middle Ages. The Hall at Grassington, for instance, is said to date back to the twelfth or thirteenth centuries; that at Markenfield is certainly as old as 1309, and Kiddal Hall, near Leeds, apart from its magnificent fifteenth-century bay window, is probably as old as either of these. All would undoubtedly be classed as pure

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mediæval houses, and though all are in West Yorkshire, and all are in stone, I will leave them to the many competent and distinguished writers whose books we all know.

Barden Tower, on the other hand, is a connecting link between the Middle Ages and the spacious days of Queen Elizabeth. Splendidly situated as it is near the banks of the Wharfe, strong and massive in spite of its ruinous state, one feels here at least as much the remembrance of a feudal castle as of a hospitable dwelling-house. It was built in the latter half of the fifteenth century by the Cliffords of Skipton for one of their six gamekeepers, and was later occupied by one of the family, who preferred its peace to the pomp and circumstance of Skipton Castle. The "Shepherd Lord," as he was called, died at Flodden Field, whither he had repaired from his retirement to lead the dalesmen against the Scots.

From what we know of the constant inroads of the Scots into the Yorkshire dales, of the constant state of fear in which the good brothers of Bolton and Kirkstall lived at their abbeys, it may reasonably be assumed that Barden Tower was so built as to withstand any attacks from these marauding invaders, and indeed to defend the Cliffords' well-stocked estates from their murderous hands. It originally had a thatched roof, but nevertheless it is as much of a castle as Haddon Hall, where all the fortifications are sham, and is an excellent example of the type of house built at a time when men were gradually giving up the old idea of defence for the newer one of domestic comfort.

Of Elizabethan houses there are not a great number in the dales, but two particularly fine examples should be noticed. A point I wish to enforce, however, is that neither of them exhibit the idea of local tradition as much as do the smaller buildings.

Fountains Hall, as most visitors to Ripon are aware, lies at the far end of the abbey grounds. As is not infrequent, it is separated from the road in front by no more than a small formal garden, but across the road the garden is continued as part of the architectural scheme. There is, to my mind, no more magnificent, no more stately, and no more beautiful building in all Yorkshire than this. The colour of its stonework is of the same perfect tone as when old Sir Stephen Proctor built it for himself and Honor, his

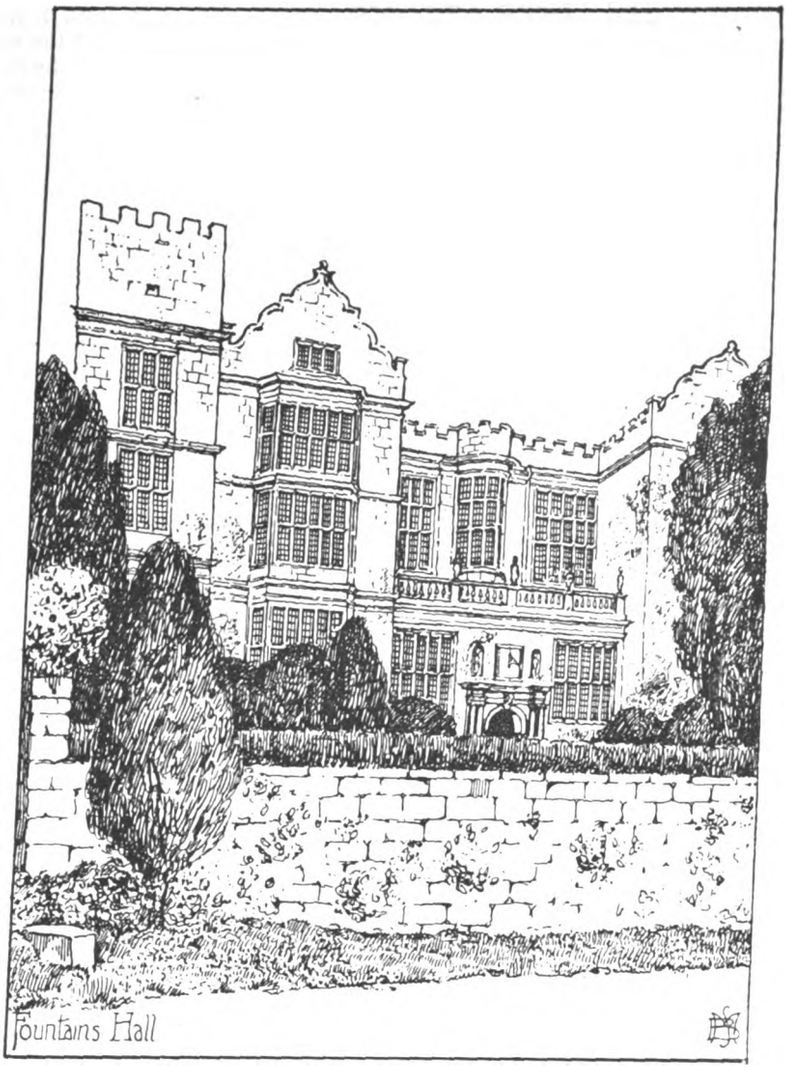
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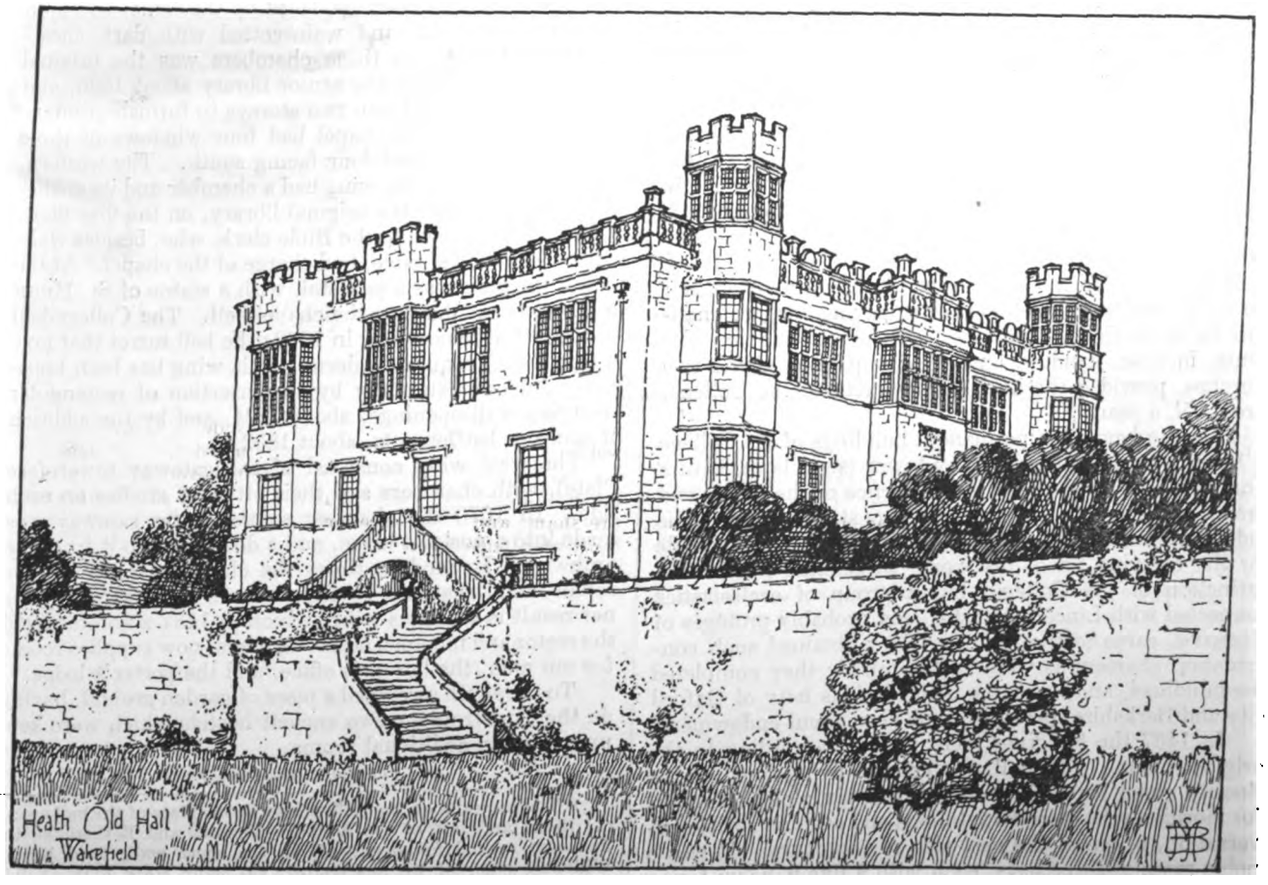
wife, from the materials of the Abbot's House hard by. This was in 1611, and I stretch a point in calling it Elizabethan, but after all the name is more appropriate to its style than Jacobean would be. Proctor was a vandal indeed, for the Abbot's House must have excelled all others of its kind in England, and its great hall alone measured 171 feet by 70 feet. Truly a fitting scene for monastic feasting, but what a descent from the austere days of 1132, when twelve earnest monks from York came to live here on Christmas Day with no more shelter than bare thatch afforded.

Yet we cannot but forgive him, admiring the stately house he has left us, and we cannot but appreciate the legend over the door, equally ill-suited to well-fed abbot or roystering knight, which tells us in the quaint language of heraldry that—

"In finding nothing ye shall gain all."

On a bend of the Calder, overlooking smoky Wakefield, there stands amid the soot-laden trees another famous home, Heath Hall. Here again I venture to claim a house of James I.'s reign as Elizabethan, for the sake of clearness rather than pause for hair-splitting, and because some authorities indeed ascribe its erection to the earlier reign. And here again we have the great windows, the formal flight of steps sweeping down to the terraced garden, the armorial bearings of the owner, his lady, and his queen over the door, and all the characteristic features of the period in which the Englishman first made his house his home. Many legends surround its ancient towers, but an architect is most struck by its very remarkable similarity to Barlborough Hall, in Derbyshire, built at almost exactly the same time, and, one may assume, by the same architect.





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ILLUSTRATIONS.

ST. JOHN'S CHURCH, PALMER'S GREEN, N.—FROM THE SOUTH-EAST—INTERIOR.

THIS is an admirable example of a modern suburban church which has been erected in a now thickly populated district to the north of London. The architects were Messrs. JOHN OLDRID SCOTT & SON.

OXFORD COLLEGE SERIES, LINCOLN.—FRONT QUAD AND ENTRANCE—FRONT QUAD.

By the Rev. ANDREW CLARK, M.A.

A VISITOR entering Lincoln College from the Turl finds himself in a small quadrangle, the whole fabric of which belongs to the fifteenth century, though much disguised by eighteenth-century defacements. In front, to the east, is the hall, with its unaltered smoke-hole or louvre, and its windows restored to the old pattern. On the left hand, to the north, is a wing which formerly contained, on the first floor, the old chapel and the old library. Behind him is the tower (see Plate), with the original rector's lodgings and the chief living rooms of the early Society. All these buildings are of date 1430-37. In the north-east corner (see Plate) a fine Perpendicular arch, under the recently added "Lincoln imp," leads to a quaint little court, where is the kitchen, an ancient fabric adapted to its present purpose at the foundation of the College; and thence to "the Grove," erected from Mr. T. G. JACKSON's designs in 1883 (see Plate), to supply rooms for fifteen undergraduates and one Fellow. In the south-east corner is the rector's lodgings, built in 1468. On the south the wing which closes the quadrangle displays shields bearing three stags trippant, thereby assigning it to the second founder (1478). Through this a passage leads to a seventeenth-century quadrangle (see Plate), bounded on the south by the chapel. Thence again a passage leads further south to the eighteenth-century Fellows' garden, under the shadow of All Saints Church, and overlooked from the west by the ancient College property of the Mitre inn (acquired 1476) and from the east by the new (1906) library (see Plate). It is the purpose of this paper to unfold very briefly the history of these buildings and of the Society whose home they have been and are.

The College was founded in 1429 by RICHARD FLEMING, twenty-second occupant of the see of Lincoln, to be a hostel for masters of arts studying theology in preparation for the clerical profession, and with the special aim of combating Wycliffite attacks on the mediæval Church.

The small church and churchyard of St. Mildred, standing in the nook between a lane leading east to the Schools and a narrow street leading south to the High Street, furnished the original site, speedily enlarged by purchase of some ancient hostels lying to the east and south. The adjacent parish churches of All Saints and St. Michael's at North Gate, united into a collegiate church of a rector and seven Fellows, after paying for two chaplains to serve the two parishes and for communion elements, incense, candles, and other requisites of the two churches, provided the initial endowment of the College, barely 15*l.* a year.

FLEMING began the permanent buildings of his College in 1430 by erecting the gateway tower (see Plate), with a room over the archway for the residence of the rector and a room over that to serve as the College strong-room. His sudden death, in January 1431, with no provision made for the carrying on of his work, threatened the instant extinction of the College; but a group of ecclesiastics connected with Lincoln Minster, and probably protégés of FLEMING, came to the rescue. They obtained such confirmation charters as were still required; they completed the buildings, and, with the help of pious laity of Oxford city and Berkshire, provided some permanent endowment.

In 1437 the buildings were finished according to the original plans. The hall, the general living-room of the Society, used for midday dinner and six o'clock supper, for morning scholastic disputations and evening social conversation, occupied the east side of the court. It was a noble room of three bays, each with a fine window facing east and another facing west, enriched with heraldic glass. In front of the dais, which occupied about a sixth of the floor at the south end, and was raised one step above the level of the rest, was a flat hearth on the floor, from which the smoke of burning logs ascended to the smoke-hole above (see Plate). Recent happy restoration under the care of T. G. JACKSON, R.A., has uncovered the chestnut timbers (see Plate), brought back the mullions, and replaced the medallions with arms of founders and benefactors. The wainscot and screen date from 1700; they are good of their kind, but the large panels are an anachronism in a fifteenth-century hall.* The fireplace was moved from the centre of the floor to the middle window on the east side in 1700. It is now filled by a splendid piece of carved work (see Plate), designed by T. G. JACKSON in 1891, which exhibits the College arms and the mitre (adopted as the College badge), the founders' initials, and the arms of two great benefactors to the hall fabric, FOREST, Dean of Wells, and CREWE, Bishop of Durham. Over it is happily preserved part of the stonework of the 1437 window.

Beyond the arched passage (see Plate) which leads to the kitchen, the hall was continued by the buttery, or store for bread, cheese, beer, &c., with cellar under it, supported on massive, rude-shaped pillars, possibly belonging to an older building and with a chamber and an attic over it. The buttery, in the domestic economy of the early College, played a large part. Here, apparently, the informal early breakfast and the equally informal forenoon "bever," or lunch of cheese and bread and ale, were partaken of, standing by the table. The room over the buttery was long the living-room of JOHN CALCOTT, senior Fellow; afterwards the undergraduates' library and principal lecture-room, and now the junior common-room.

The north wing was divided unevenly by a staircase. The eastern portion, about two-thirds of the whole, furnished on the ground floor two "chambers," with their attached "studies." A chamber was a large living and sleeping room, where two or more "chamber-fellows" had their beds. It went the whole width of the building, and had a two-light window in each wall. At its corners cubicles were fenced off from it, each with a one-light window and going no more than half the width of the building. In these studies the sharers of the chamber could seclude themselves for private study. The two sets of rooms here have been displaced by the senior common room, opened 1662, and wainscotted with dark chestnut in 1684. Above these chambers was the original chapel, converted into the senior library about 1655, and quite recently divided into two storeys to furnish ordinary College rooms. This chapel had four windows of three lights facing north and four facing south. The western, and smaller, half of the wing had a chamber and its studies as the ground floor; the original library, on the first floor, and an attic assigned to the Bible clerk, who, besides waiting at the Fellows' table, had charge of the chapel. At the foot of the stair was a pedestal, with a statue of St. HUGH OF AVALON; at the top, the chapel bell. The College bell was recast at Woodstock in 1662; the bell turret that now is (see Plate) is quite modern. This wing has been hopelessly defaced externally by the insertion of rectangular Georgian wall-openings, about 1824, and by the addition of spurious battlements, about 1852.

The west wing consisted of the gateway tower (see Plate), with chambers and their attached studies on each side. In 1670 the chamber south of the gateway was made into a porter's lodge, and a door cut into it from the archway. In modern times the chambers have become rooms, and the studies small bedrooms and pantries. The net result is that this wing, which in 1437 accommodated the rector and nineteen other members, now supplies rooms for ten men, the bursar's office, and the porter's lodge.

To the south stretched a piece of garden ground, having on the Turl frontage two ancient hostels which were kept up to supply additional rooms.

(To be continued.)

* The portraits on the walls shown in the Plate of the hall are:—(1) Right and left of the fireplace, Fleming and Rotherham, the first and second founders; (2) on the south wall, Lord Keeper Williams, donor of the new chapel; (3) right, Mark Pattison, late rector; and left, Dr. Merry, present (thirtieth) rector; and (4), above, Dr. Tatham, twenty-sixth rector.

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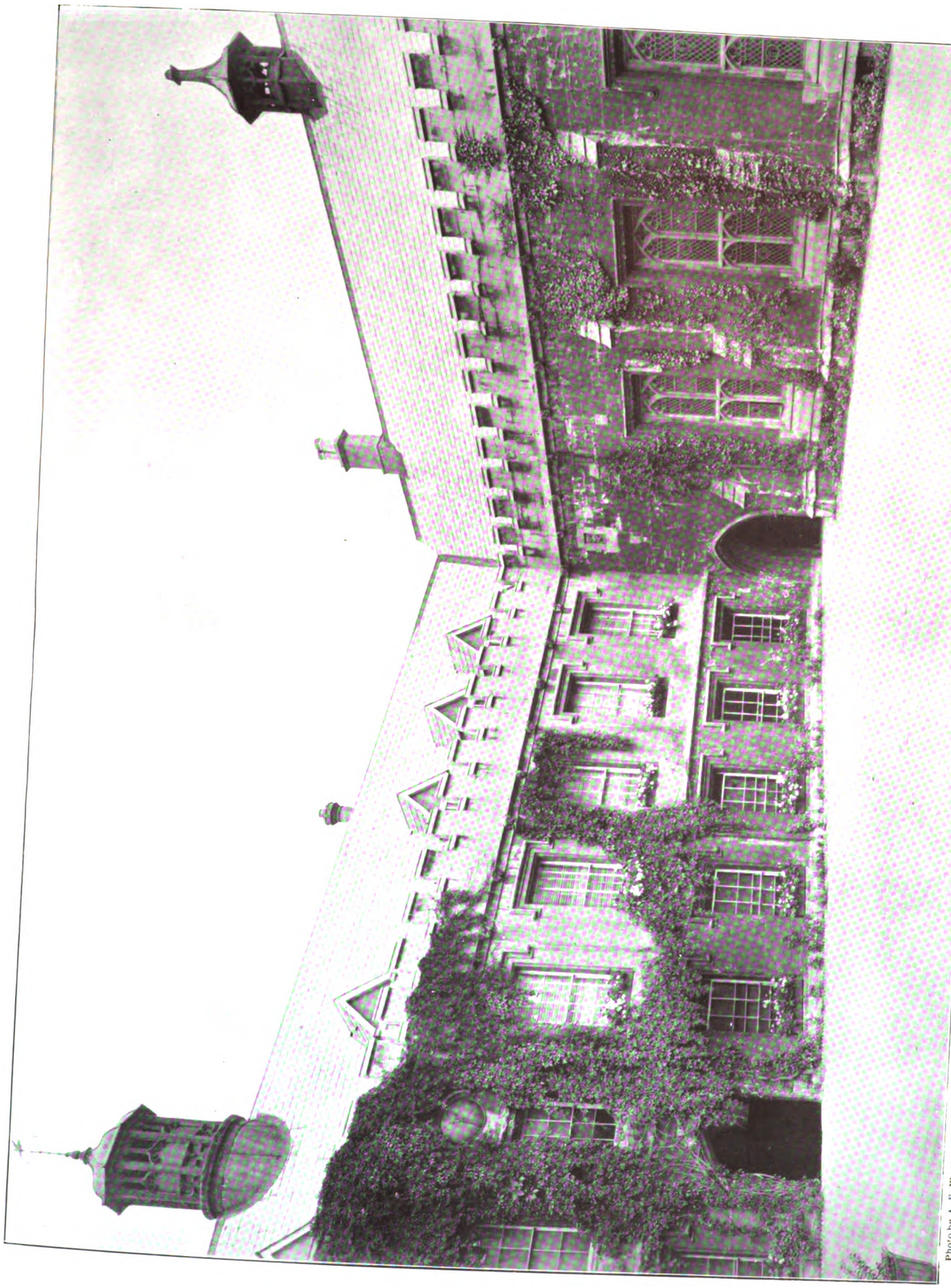


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ST. JOHN'S CHURCH, PALMER'S G

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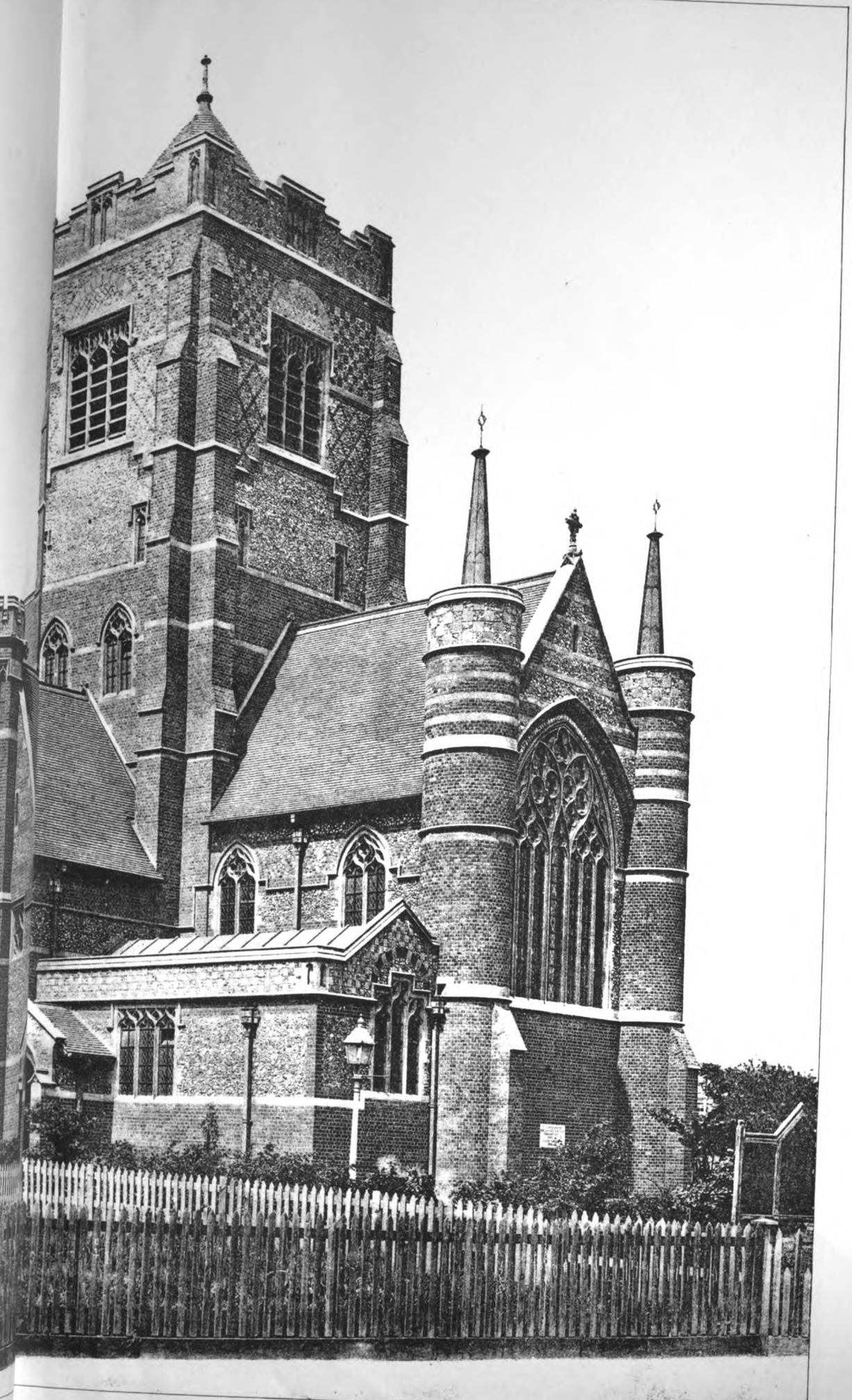


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ARCHITECTURAL GLEANINGS FROM SOME NINETEENTH CENTURY LETTERS.

THESE gleanings are from letters written by David Roberts, R.A., David Ramsay Hay, James Ballantine, and others, about the middle of the nineteenth century.

David Roberts was born in the village of Stockbridge, near Edinburgh, October 24, 1796. The house is in Church Street, marked by a board with an inscription, and has the date 1605 on one of its door-lintels. This, however, with the other material of which the house is built, was brought from Bank Street, Edinburgh, when that thoroughfare was formed from the "High Street" to the "Mound." As the street was opened in 1798, the house in which Roberts was born must have been quite new at the time of his birth.

Roberts was sent to school when eight years old, and on leaving became apprentice to Gavin Bengo, a house-painter. At the close of his apprenticeship, in 1815, he went to Perth, and was back in Edinburgh in 1816 as scene-painter to Mr. Bannister, who had a circus in North College Street.

Still following the same occupation, he toured through England as far as York, returning to Edinburgh in 1818, when he was there engaged in scene-painting in the Edinburgh Pantheon and in the Theatre Royal.

He then commenced oil-painting, his first ventures being New Abbey in Dumfriesshire, old houses in the Cowgate, and John Knox's house in the High Street, which were all sold to Edinburgh purchasers.

These were followed by a view of Dryburgh Abbey, exhibited in London at the Institute of Painters in Water-Colours. From this time he had an uninterrupted career of success in his profession till the day of his death in 1861.

David Ramsay Hay was born in the West Port of Edinburgh in 1798, and was brought up in the same workshop with David Roberts as a house-painter. He invented a system of angles which he applied to the form of the human body and to Classic buildings, and published several works relating to this invention, such as "Geometrical Principles of Beauty Analysed" (1843), "Geometrical Beauty of the Human Figure defined, and Proportion Applicable to Architecture" (1851), "Science of Beauty as developed in Nature and applied to Art" (1856).

He secured a successful practice in the walks of decorative art, and through the medium of the Æsthetic Club, which he founded, had much interesting correspondence with some of the leading art thinkers and artists of his day, whose opinions we shall take occasion to quote in the course of this paper.

James Ballantine was born in Edinburgh in the year 1808, and in due time followed the calling of glass-painter, which is still carried on at the present day by his grandson, James Ballantine, to whom the writer of this article is indebted for the loan of the letters which form the groundwork of our present subject.

He studied at the Edinburgh School of Design, under Sir William Allan, in 1830; began business as a house-painter, thereafter becoming a glass-stainer, an art which he did much to revive. He executed the stained-glass windows in the House of Lords in 1845 and published in that year a "Treatise on Glass-Painting," a copy of which he later presented to John Ruskin, who, in acknowledging receipt, remarks "that if I am again led to speak on the subject of painted glass, I should feel it almost incumbent upon me to point out the singular futility which induces a popular and practical writer to give examples of every kind of glass, except that which I believe to be the only perfect kind, the glass of the thirteenth century."

He was the author of some of the sweetest Scotch lyrics and of the two works "The Gaberlunzie's Wallet" and the "Miller of Deanhaugh," but is specially linked with our subject by his "Life of David Roberts."

Roberts's special gift was in the delineation of architecture, which no doubt accounts for the important commission about which he wrote to D. R. Hay, June 11, 1830, as follows:—"I have been honoured with a commission to paint a picture for the Marquis of Stafford, not only one of the richest noblemen in England, but of the most refined taste as regards the arts; and the Marchioness is a countrywoman of my own, being Countess of Sutherland before marrying Lord S. The subject of the picture is the grand staircase of Stafford House. This house, I ought to tell you, was built for the late Duke of York, which the poor Duke did not live to see finished. It was then purchased by its present possessor."

He seems to have been commissioned to paint the Coronation scene of her late Majesty in Westminster Abbey, for he writes Hay, September 12, 1831:—"I was anxious to see the ceremony of the Coronation at Westminster Abbey, which I am happy to say I was successful in seeing, at the expense of sitting from three in the morning until the ceremony commenced. I am now engaged on a sketch of the subject on canvas."

On June 28, 1832, there is a letter from Great Queen Street, Westminster, referring to Sir Walter Scott's final illness:—"The greatest interest here is manifested among all classes and all parties concerning Sir Walter Scott. I am happy to see by the evening paper of yesterday that he was much easier yesterday. To-day I have not heard. I fear from all accounts he will not get over it." Sir Walter died on September 21 of that year.

We learn from Roberts's correspondence of 1835 of the movement for erecting a monument in Edinburgh to the memory of Sir Walter Scott and for which he prepared two designs in the form of an Egyptian obelisk and a Gothic cross. He afterwards remarks to Hay:—"But as you say Playfair is doing an obelisk, I hardly think it was fair to allow him to see my drawings and then take away his own."

Next year, on February 2, he writes referring to his own design:—"I followed as nearly as I could the instructions laid down to me by the secretary, Mr. Skene—that it should be in the shape of a Norman or Gothic cross, with or without figures. So far as my judgment goes, I cannot see the necessity of a statue of the 'Great Magician' himself; the object may be attained as well by an appropriate structure dedicated to that purpose."

The designs for the monument seem to have had a very tedious history, for he states in a letter two years later (January 24, 1838), when apparently the final competition was afoot:—"With regard to the design you mention of Mr. Playfair, although I have no doubt it would be very beautiful in itself, and also might be a great ornament to the city, yet with all due deference to him, I think it was scarcely appropriate to the memory of the 'Great Magician.' It ought to be something that would connect it with the Gothic of the Middle Ages; anything to remind you of Greece or Rome would be quite out of character." Playfair's design was a triumphal arch in the Corinthian style with a statue of Scott on the summit.

Roberts was quite right. But why, with that opinion, did he submit a design for an Egyptian obelisk? He goes on:—"Therefore, as it is to be Gothic, I think, without assuming too much to myself, I am quite as competent to make the design as any of the names you mention. With regard to the estimate, you could manage that for me by submitting the design to one of your architectural friends." 5,000*l.* or 6,000*l.* was to be spent.

Ten days after (February 4) he writes Hay:—"I have lost not a moment in making the necessary alterations. I have made two large drawings, one simply an elevation, and the other the view of the same in perspective. The scale I have made it is 45 feet, including the six steps upon which the monument stands and exclusive of the figure of Scott, by which it is surmounted. You will perceive by the background I have placed it in the space of ground at the intersection of the New Bridge [George IV. bridge, constructed in 1827] and Bank Street with the Lawn Market, as I think it would be more in harmony with the church of St. Giles and the buildings around it than in any other part of the city I am aware of, to say nothing of its being nearly on the same spot as the scene of one of his best works, viz. 'The Heart of Midlothian.' I cannot be brought to think that a preference ought to be given to that design that selects all the enrichments from a particular abbey—Melrose. This, the monument, I consider the tribute of a grateful country to one whom they are justly proud of; and for that reason the architecture of the structure ought to be characteristic of the man and his works, of *that architecture he gloried in describing.*" And then he remarks that he prefers the Perpendicular of Henry VII. Chapel and St. George's, Windsor, to the earlier period of Melrose.

He encloses a rough sketch of the design, which suggests that the finished drawing itself did not accompany the letter.

He afterwards carried his design further by the substitution of two terraces for the six steps of the sketch, a copy of which is herewith given taken from a photograph of the original kindly lent by Dr. Ross, one of the joint authors of "Castellated and Domestic Architecture of Scotland." Evidently the Princes Street site had been fixed upon by this time, for the Lawn Market would have been quite unsuitable for so large a work, occupying a space of 65 feet square and measuring 72 feet high.

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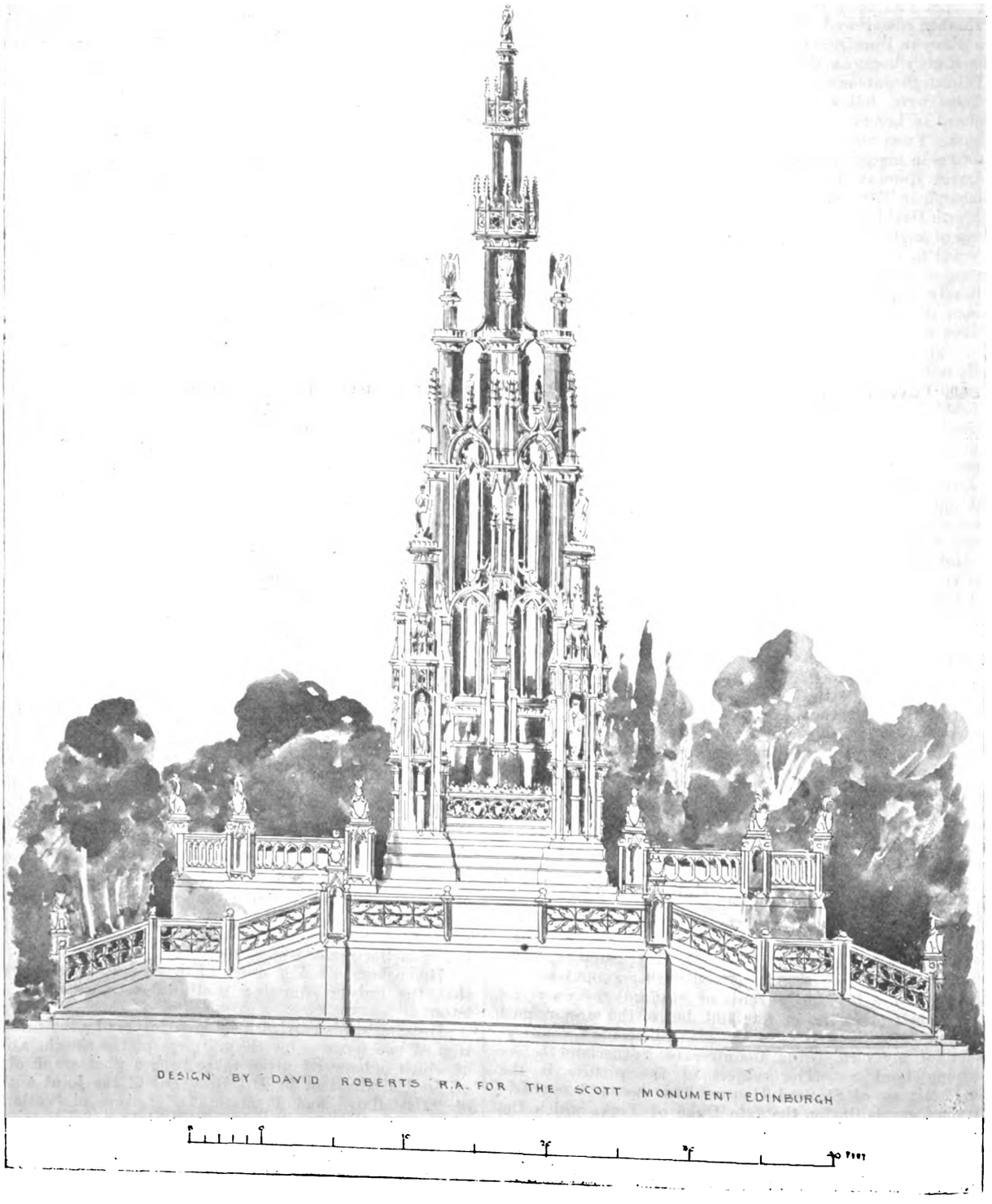
The design has Spanish feeling about it, because Roberts describes the upper part as having "angels holding light metal crosses as in the tower of the chapter-house of Burgos Cathedral, or holding shields with the arms of Scott or the names of his various works." Roberts began his Spanish pictures in the year 1832.

Clever and original though Roberts's design is, the executed one by Kemp is much better, and happily the promoters were able to spend more money upon it than was originally intended. The ultimate cost was 15,650*l*.

Roberts's connection with the monument was renewed in 1854, when he made designs for the four stained-glass windows in the central chamber which were carried into effect by James Ballantine. These sketches are in the possession of Mr. Ballantine's grandson. The subjects are:—No. 1, Edinburgh; No. 2, Scotland; No. 3, St. Giles; No. 4, St. Andrew.

He reminds Mr. Ballantine in the letter accompanying the sketches of the discovery of "the old writing-desk we found in a loft at Abbotsford, in which the MS. of 'Waverley' was found, after having been lost for many years. A relic of that kind would be prized now, and probably is still in the same hay-loft."

On October 19, 1842, Roberts was entertained in



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Edinburgh at a banquet presided over by Lord Cockburn, who made a very eulogistic speech, to which Roberts replied. Lord Cockburn had written Ballantine on the 12th in these words:—"In order to assist me in attempting to perform the task you have made me very rashly and unworthily undertake, I wish you would tell me something of Mr. Roberts's ment of which he needs, as far as Edinburgh can get, encouragement? In short, tell me what I am to say—because you are aware that I am one of the many who, with a strong disposition to add art to Scotland's other eminences, and therefore occasionally presuming to appear among artists, am totally ignorant of art and utterly unworthy to speak



DESIGN FOR STAINED GLASS—"EDINBURGH."
From Original Sketch by DAVID ROBERTS, R.A.

history and of what are held to be his *peculiar* merits as an artist. I know that architectural representation is his principal line and that in that he is unrivalled; but what are his peculiar excellences in this walk, and what is his peculiar position as an artist now? What is his main triumph? Has he any object in the prosecution or attain- a word on the subject—and this I say from no affectation of humility, but because it is true that it would be absolutely ludicrous to say anything else. So tell me a few good and useful topics connected with Mr. Roberts as an artist and as a man."

(To be concluded.)

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ICKENHAM CHURCH AND SWAKELEYS HOUSE.*

THE stranger who would form a correct opinion of the English character must not confine his observations to the metropolis. He must go forth into the country; he must sojourn in villages and hamlets; he must visit castles, manor houses, farmhouses, cottages; he must wander through parks and gardens, along hedges and green lanes; he must loiter about country churches; attend rural festivals and see the inhabitants in all their conditions and all their habits and humours. For the English are, as a matter of fact, strongly gifted with the rural feeling. Thus wrote Washington Irving. And to-day we loiter in the midst of scenes truly characteristic of English life, but unfortunately fast disappearing before the civilisation which we so much applaud. The village of Ickenham is typically old. Quiet and secluded, it is distant but sixteen miles from London. Within a short distance there stand the picturesque village church nestling amongst the trees, the green, the pond, the pump, the inn, and a few cottages. Near by is the manor house with its park and its outbuildings. Ickenham was anciently known as Ticeham, and later as Tykenham. Its population is only 350. It is situate in the Hundred of Elthorn, and at the time of the compilation of the Domesday Book the land was held mainly by Earl Roger and Geoffrey de Mandeville. The church is dedicated to St. Giles, dates from 1830, and is one of those rich morsels of quaint antiquity which give such a peculiar charm to English landscape. Standing in the midst of a country formerly tenanted by ancient families it contains within its cold and silent aisles the congregated dust of many noble generations. The interior walls are incrusted with monuments of many ages and styles. The eye is struck with instances of aspiring mortality, a memorial which human pride has erected over its kindred dust in this temple of the most humble of all religions.

The architecture of the church is mostly of the Decorated and Perpendicular character. It has a high-pitched roof with red tiles and dormer windows. There is no tower, but in



ICKENHAM VILLAGE.

its place there is a timber belfry with a kind of pinnacle on it, for the builders could not get much stone in these parts. The churchyard is interesting on account of the number of stones erected to the memory of devoted servants at Swakeleys House. There is one to Elizabeth Hargrave, who died in 1816 at the age of fifty-three, after serving as housekeeper for thirty successive years. Another to a housemaid who died in 1839 at the age of sixty-eight, after forty years' service. And again to a nurse who died in 1864 at the age of ninety, after fifty years of service. Amongst the memorials inside the church are three brasses, which have been removed from the floor and have been placed on the walls of the chancel and near by. The most interesting one is to the memory of William Say, who died in 1582, in the reign of Queen Elizabeth. This worthy was "Registrar in Causes Ecclesiastical" to the Queen's Majesty, and set a good example by rearing a family of sixteen children. Their effigies, with those of their parents, appear on the brass and are in excellent condition. The other two brasses commemorate the Shordiche family, who held the lordship of the manor from the fourteenth to the end of the eighteenth century. They were succeeded by the Clarke family. There is a tombstone at the base of the north-west wall dating from 1669. There is also a piscina in the south wall near the pulpit and another in the chancel. The old porch with the remains of a holy water stoup is very interesting.

The registers date back to the beginning of the sixteenth century, and amongst the church plate is an old flagon.

One of the most remarkable of the worthies connected with Ickenham was an eccentric named Roger Crab, who early in the seventeenth century told the story of his life in one of the sensational pamphlets which delighted our forefathers in times before newspapers made of sensations everyday affairs and of everyday affairs sensations. Crab was a devotee of the simple life long before the phrase had been devised, and his was the simple life in fact, not simple in name and complex in practice. He was a vegetarian from the age of twenty, excluding from his diet even butter and cheese, and he gradually further restricted his foodstuffs until he brought himself to living—for three farthings a week—upon dock leaves, grass and water. Small wonder that he gained a reputation as astrologer and medicine man, having as many as a hundred patients at a time, and earning something of fame as a wizard.

But the splendid Jacobean manor house of Swakeleys is Ickenham's principal attraction, and is considered to be the second in Middlesex only to Holland House in the beauty and elaboration of its architecture.

Throughout the country we can see those old manor houses where the squirearchy of Great Britain have lived for centuries, almost all of them inhabited long before the discovery of Australia, and some even before the discovery of America, and representing a civilisation, a country life, which all should see.

Now such a house as Swakeleys helps us to realise and appreciate the beauty and the artistic charm of these quiet, sometimes unimposing, and yet often stately country houses—stately even in their decaying condition when used as mere farmsteads—which are still to be found, and with which no other land but England can delight the rambler or the tourist, whether armed with sketching-block or note-book, or merely seeking to obtain pleasurable and peaceful mental impressions.

To marshal in orderly but brief array the origin of manors and the evolution of the manor house, and to proceed to deal with the materials of construction (differing so much in various districts), the exterior details, the interior details, the metal work, and the gardens and surroundings affords an intelligent enjoyment and appreciation of the domestic architecture of the past, from its practical as well as its artistic side, which cannot fail to be stimulated by a visit to an attractive house of this character. England is well known, above all other parts of Christendom, for the reverent beauty and attraction of its village churches, which even centuries of irreligious bigotry, of apathetic neglect, or crude restoration have failed to destroy, and second only to its ancient places of worship are the old-time homes of the principal worshippers.

The manor house is the principal dwelling-place in most villages. Hidden away from the gaze of the multitude it seems in quest of peace and to love obscurity. Hence few know how fair these houses are, how full of grace and charm, as they stand in their sweet old-fashioned gardens, surrounded by rare blendings of art and nature. Sir William Temple was moved to write, "The greatest advantages men have by riches are to give, to build, to plant and make pleasant scenes." So the builders of these country houses built, not for themselves but for their sons and grandsons. They stamped their impress on the houses they reared. They expected their children to respect their gift to their families. They carved their names, or their initials, or their arms over their doorways. They adorned them with texts or homely verse, pious thoughts, or quaint or humorous conceits. They built surely and well, so that their houses might last, not for their own pleasure, nor for their own use, but for their descendants, who would thus venerate the hand that laid those stones and respect the memory of their forefathers and the honour of their house.

With the beginning of the seventeenth century the "dining parlour" came into vogue, and the old fashion of the family and household meeting in the common hall fell into desuetude. Henceforward the servants adopted the custom of "keeping themselves to themselves" quite in accordance with modern notions, and great attempts are to be noticed in Elizabethan houses towards a formal arrangement of rooms and galleries by means of which the household was divided. In the E-shaped or Elizabethan house the long stroke represents the hall, the wings projecting on one side only—the apartments of the family and servants respectively—and the central stroke represents the porch. The Jacobean house is really a double Elizabethan house, or an extension of the wings both sides of the centre stroke, but as the artists of that period had become more imbued with the Italian spirit an increased profusion of ornament, wonderful plastered ceilings, and elaborately carved panels and mantlepieces are to be noticed.

The name Swakeleys is derived from a former owner

* Read at a meeting of the Upper Norwood Athenæum by Mr. A. J. Pitman.

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named Robert Swalclyve, who possessed the estate in the fourteenth century. Swakeleys is a very interesting example of domestic architecture dating from 1638, as recorded on the heads of the rainwater pipes outside the house. The style of the building shows the transition from the late Jacobean work to the more severe Classic work which succeeded it. It is built of red brick with dressings in part of stone, and plaster dressings in the upper and other parts ornamented with fleur de lys. The window mullions are of marble below and of brick covered with plaster in the upper and other parts. Some of the windows are bayed, but the lights are filled with wooden frames and casements. The plaster dressings are Classic in style of moulding and have a pleasing effect. The chimneys are in stacks taken up in one fine mass to about the roof ridge level, and the flues are then displayed by being set diagonally, thus forming most picturesque clusters of shafts, and showing the mediæval influence that was still being felt at the time the house was built. The numerous gables, in number amounting to twenty-two, show a curious mixture of Renaissance and Classic influences. The stable and coach-house and other outbuildings seem to be of the same date as the house, forming a fine and stately arrangement, which has been somewhat spoiled by the promiscuous building from time to time of larders and other ill-considered erections on the back of the house. The hall is paved with black and white stone. The hall screen is decorated on the inner side with busts of Charles I., Fairfax, and Lord Essex. The walls of the hall are panelled with large panels of oak. The mantle of the hall fireplace is of marble with large bold mouldings, similar in style to the mantles at Hampton Court.

Walton, possesses a copy of the earliest work on fishing, dating from 1496, as well as the first five editions of Walton's "The Compleat Angler."

Lysons says that the house was built by Sir Edmund Wright in 1638, became the property of Sir James Harrington by his marriage with the daughter of Sir Edmund Wright, and was sold by him to Sir Robert Vyner (sometime Lord Mayor of London) in 1665.

From Sir J. Harrington's (the translator of Ariosto) rules for servants, we obtain a very clear conception of the internal government of a country gentleman's house in 1566.

A servant who is absent from prayers to be fined. For uttering an oath, 1*d.*; and the same sum for leaving a door open.

A fine of 2*d.*, from Lady Day to Michaelmas, for all who are in bed after six, or out after ten.

The same fine, from Michaelmas to Lady Day, for all who are in bed after seven, or out after nine.

A fine of 1*d.* for any bed unmade, fire unlit, or candle-box uncleaned after eight.

A fine of 4*d.* for any man detected teaching the children obscene words.

A fine of 1*d.* for any man waiting without a trencher, or who is absent at a meal.

For anyone breaking any of the butler's glass, 12*d.*

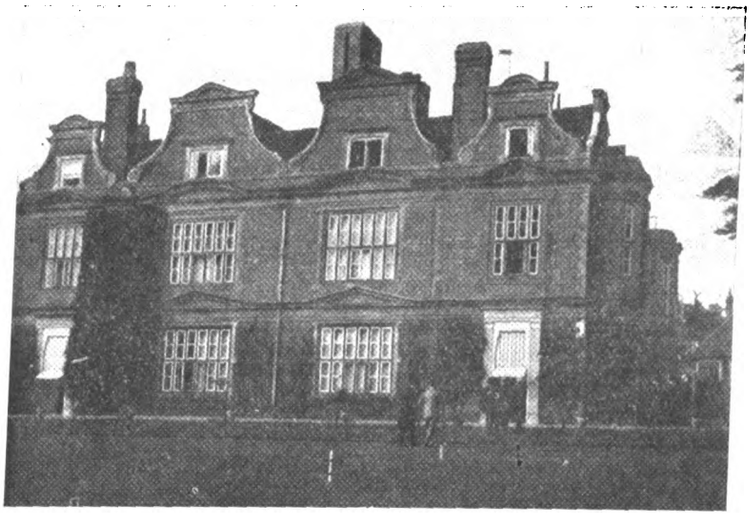
A fine of 2*d.* for any one who has not laid the table for dinner by half-past ten, or the supper by six.

A fine of 4*d.* for anyone absent a day without leave.

For any man striking another a fine of 1*d.*

For any follower visiting the cook, 1*d.*





SWAKELEYS, MIDDLESEX.

SWAKELEYS, MIDDLESEX.

It contains an immense cast-iron fire back and a bust of Milton. The dining room is completely panelled with small panels of oak, as used in the Jacobean and Elizabethan periods.

The library has large panels with framings decorated with appliqué detached pieces of carving, the whole being painted to imitate oak.

The grand staircase rises over the garden entrance, and is lighted by windows which were designed and placed wholly with a view to outside effect. The stairs are of carved oak. The walls and ceilings are entirely covered with paintings in the Verrio style, and put on wholly without reference to the doors and other architectural features.

At the top of the stairs is a door leading into the great drawing room, which occupies the whole of the central portion of the west front on the first floor, and measures about 55 feet by 30 feet. The walls are covered with large panels painted white. The ceiling is divided into large panels deeply set between heavy beams. The beams are cased with plaster, similar to those of the ceiling of the Banqueting House at Whitehall. The room contains a number of interesting portraits.

The orangery at the north end of the east front is similar to the old orangery at Hampton Court.

The house contains many pictures of great interest by Romney, Hamilton, Westall, Landseer, Wheatley, Cosway and others. There are also three pieces of tapestry representing landscape and birds. The present occupier—Mr. Arthur N. Gilbey—being an enthusiastic follower of Izaak

A fine of 1*d.* for any man appearing in a foul shirt, broken hose, untied shoes, or torn doublet.

A fine of 1*d.* for any stranger's room left for four hours after he be dressed.

A fine of 1*d.* if the hall be not cleansed by eight in winter and seven in summer.

The porter to be fined 1*d.* if the court gate be not shut during meals.

A fine of 3*d.* if the stairs be not cleaned every Friday after dinner.

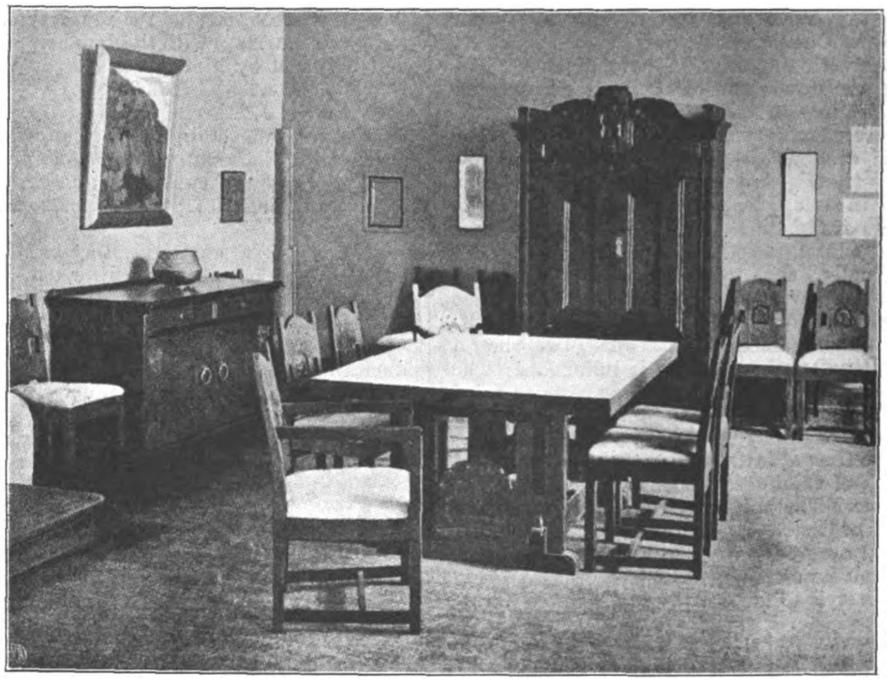
All these fines were deducted by the steward at the quarterly payment of the men's wages. If these laws were observed, the domestic discipline must have been almost military in it.

Swakeleys is most interesting as an excellent example of a link in the chain of the architectural history of the country, reminding one of the earlier Renaissance work, the work of the Banqueting House at Whitehall, and the later work at Hampton Court.

The house has but little history of general interest beyond the fact that it was occupied by Sir Robert Vyner, who as Lord Mayor entertained Charles II. at a banquet, to which attaches a story told by Steele. It is said that Vyner, having drunk over-many toasts, when the King left pursued him hastily, and, catching him first by the hand, cried out, with a vehement oath and accent, "Sir, you shall stay and take t'other bottle." The light-hearted monarch looked kindly at him over his shoulder, and with a smile and a

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MODERN EUROPEAN ARCHITECTURE.
NORWAY.



[From *Arkitektur og Dekorativ Kunst.*

DINING-ROOM FURNITURE.—Designed by MAGNUS POULSSON, Architect.

graceful air repeated the line of the old song, "He that's drunk is as great as a king," and immediately turned back and complied with the request of his host. It is related by Pepys in his immortal diary that my Lord Mayor Vyner had a nigger boy in his service who died of consumption. For some odd reason he caused his body to be dried in an oven, and kept the mummy for many years. One would like to know what became of the little dried nigger boy.

Swakeleys stands amidst beautiful grounds, through which a little stream flows into a small artificial lake. On the lawn is a sundial which was found buried in the grounds, and amongst the trees is a copper oak, which at one time was the only one known to exist in England.

The approach to the house is poor, as the road winds out of the direct course and comes to the front in a sidelong direction.

Nothing can be more imposing than the magnificence of English park scenery. Vast lawns, clumps of trees, rich piles of foliage, the solemn pomp of groves and woodland glades with deer and pheasant to please the eye, the running brook, the sequestered pool, and some rustic temple or sylvan statue combine to give an air of classic sanctity to the seclusion. The great charm, however, of English scenery is the moral feeling that seems to pervade it. It is associated in the mind with ideas of order, of quiet, and of sober, well-established principles, of long usage and revered custom. Everything seems to be the growth of years of regular and peaceful existence. The old church of remote architecture, with its low portal, its tower, its windows, often rich with tracery and painted glass, its stately monuments of warriors and worthies of the olden time, ancestors of the present lords of the soil; its tombstones, recording successive generations of sturdy yeomanry, whose progeny still plough the same fields and kneel at the same altar; the parsonage, a quaint, irregular pile, partly antiquated, but repaired and altered in the tastes of various ages and occupants; the stile and footpath leading from the churchyard across pleasant fields and along shady hedgerows, according to an immemorial right of way; the neighbouring village with its venerable cottages, its public green sheltered by trees under which the forefathers of the present race have sported; the antique family mansion, standing apart in its own domain, but looking down with a protecting air on the surrounding scene—all these common features of English landscape evince a calm and settled security and hereditary transmission of homebred virtues and local attachments that speak deeply and touchingly for the moral character of the nation.

This Society is greatly indebted to Mr. Arthur Nockolds Gilbey for the valuable privilege of being able to visit the house in the preservation of which he takes such a keen interest. And the nation is no less indebted to him for his excellent care of such a national treasure.

In the compilation of this paper I have to express my thanks to Mr. Harradence for his able assistance, and to acknowledge my indebtedness to the *Builder* for an article on the occasion of a visit to this house by another similar Society, and to the usual authorities on all matters of the nature treated of herein.

A STUDY OF BASE AND BEARING PLATES FOR COLUMNS AND BEAMS.*

By N. CLIFFORD RICKER, Professor of Architecture, University of Illinois.

B.—For Cast-iron Plates of Tapered Thickness.

SUCH plates are of uniform thickness only beneath the end of a column or beam, and are flat on the under side, but are bevelled off on top from column to edge of the plate. These edges are usually made at least ⅜ inch thick, and a good rule is to make the edge one-fourth the thickness at the middle. These formulas are deduced for sharp edges or a trapezoidal fracture section, and they are therefore only approximate for plates with thick edges.

(*a*) For square plates (fig. 4).

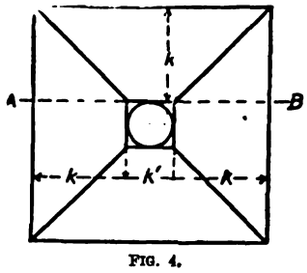


FIG. 4.

Let k = projection of the edge of the plate outside the column, measured in inches and perpendicular to the edge.

k' = side in inches of square on top of plate and tangent to column.

The line of fracture AB is parallel to a side.

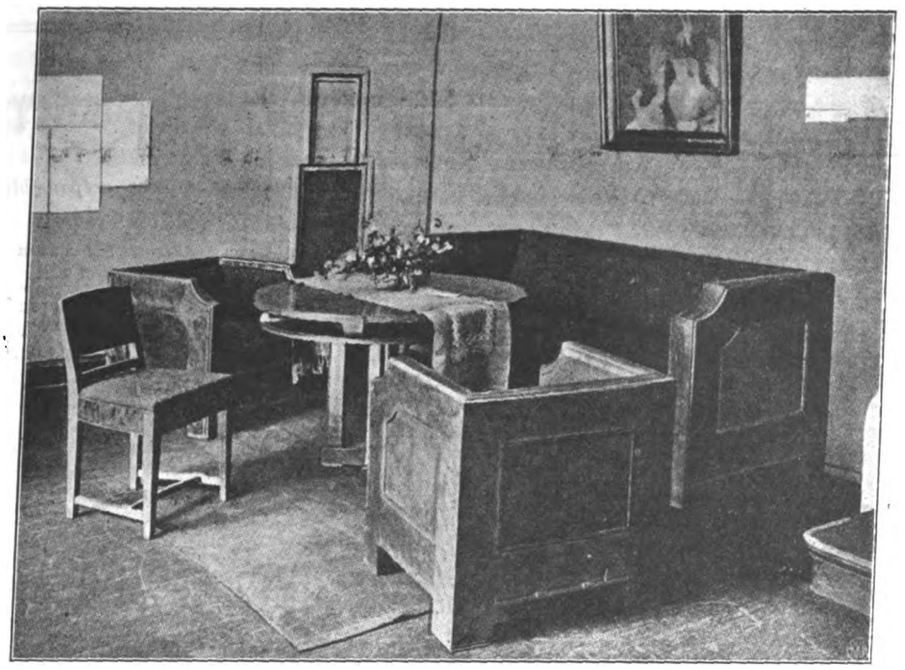
The thickness in inches of plate at middle is then given by the formula

* From a publication by the University of Illinois Engineering Experiment Station.

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MODERN EUROPEAN ARCHITECTURE.

NORWAY.



[From *Arkitektur og Dekorativ Kunst.*

SITTING-ROOM FURNITURE.—Designed by MAGNUS POULSSON, Architect.

$$t = \frac{k}{50}\sqrt{\frac{6\,p\left(k + \frac{k'}{2}\right)}{k + k'}} \qquad (4)$$

(*b*) For octagonal plates (fig. 5).

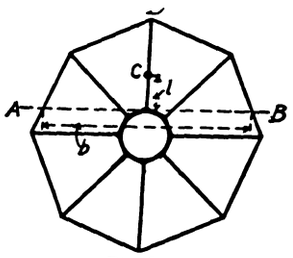


FIG. 5.

In the manner already explained for the octagonal steel plate may be found the area a of the segment ADB, its centre of gravity C, and the distance l.

The thickness in inches at the middle is then approximately

$$t = \frac{1}{50}\sqrt{\frac{12\,apl}{b}} \qquad (5)$$

(*c*) For circular plates (fig. 6).

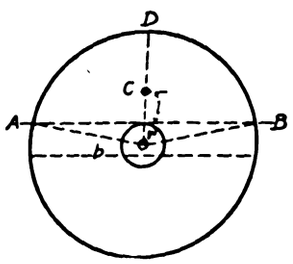


FIG. 6.

As for circular steel plates :—

$a = \frac{A\beta}{360} - \frac{bR}{2}$ = area in square inches of segment ADB.

$l = \frac{b^3}{12a} - R$ = perpendicular distance in inches from C to line AB. The actual fracture section lying between a very flat hyperbola and its chord, a parabola may be substituted therefor without material error.

The thickness at middle is given by the formula

$$t = \frac{1}{50}\sqrt{\frac{35\,apl}{8\,b}} = \frac{1}{23.9}\sqrt{\frac{apl}{b}} \qquad (6)$$

V.—RESULTS OF TESTS BY C. R. DICK.

Employing the preceding formulas, Mr. C. R. Dick designed in 1907 a series of square, octagonal and circular plates of steel and of cast iron, and afterwards tested them in the testing laboratory of the University.

Each plate had a bottom area of 400 sq. inches, and transmitted the very moderate safe pressure of 50 lbs. per sq. inch, making a total maximum safe pressure of 20,000 lbs. for the entire plate. The thickness of each plate was made such that the maximum safe fibre stress in the fracture section produced by this maximum safe pressure should not exceed 16,000 lbs. for steel or 2,500 lbs. for cast iron in tension, as required by the Chicago ordinance.

The distribution of the pressure of the plate uniformly over the lower surface required some form of elastic cushion between

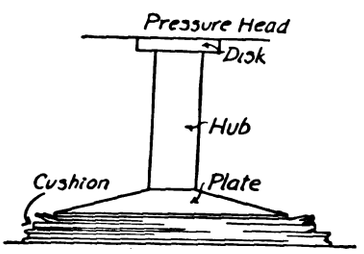


FIG. 7.

the plate itself and the very rigid bed of the testing machine. A cushion was composed of several folded blankets, a folded woollen comfortable, and two thicknesses of rubber packing, but it failed under moderate pressures, though not sufficiently to seriously injure the plates except in the case of the cast iron (fig. 7). A cushion of dry sand forming a layer 2 inches thick was enclosed within a steel hook a little larger than the plate, but the sand packed irregularly and failed to transmit a uniform pressure. A satisfactory cushion was finally composed of eleven layers of oak pieces, cut $24 \times 3 \times \frac{7}{8}$ inch piled in cross-wise layers, leaving $\frac{1}{4}$ inch spaces between the pieces to permit expansion (fig. 8). This cushion proved to be sufficiently elastic and also able to sustain pressures sufficient to break the cast-iron plates. Indeed it later supported without great injury a load of 620,000 lbs., or thirty-one times the safe pressure for which the plates were designed. Any injured pieces could

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easily be replaced in order to maintain the efficiency of the cushion.

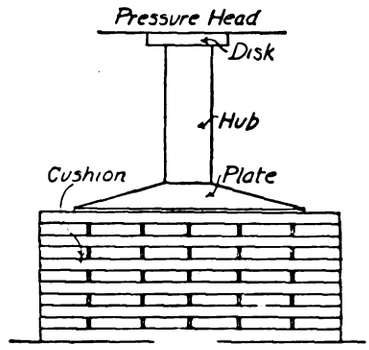


FIG. 8.

Pressure was applied to the flat top of the plate by a hollow cylindrical cast-iron hub 12 inches long, 4 inches external diameter, and ¾ inch thickness of metal. Since the plates were not planed on top (which is seldom done in practical construction), several thicknesses of heavy manila paper were inserted between the hub and the plate. On the hub rested the pressure head of the testing machine, while the elastic cushion was placed between the plate and the bed of the machine. Thus the conditions of the test fairly represented those existing in actual structures, where the masonry yields somewhat and is not absolutely rigid like the bed of the testing machine.

The square steel plates were ⅛ inch thick; the octagonal and circular steel plates were ¾ inch thick. The upward deflections of their outer edges were measured at four points to $\frac{1}{1000}$ inch, and each plate was gradually loaded to 120,000 lbs., or with six times its maximum safe load. This produced an average maximum deflection of 0.29 inch, leaving a permanent set averaging 0.18 inch when the pressure was removed. The plate was thus dished, but no failure or cracks were produced.

These results show that a steel base plate bends more than one of cast iron, and that it does not so uniformly distribute its load over the masonry beneath it as a more inflexible cast-iron plate. It follows that the latter plate is preferable for the purpose. Empirical rules usually make steel plates one-half the thickness of cast-iron plates supporting equal loads.

Mr. Dick deduced from his experiments the following conclusions for steel plates:—

"1. The (preceding) formulas for the design of steel base plates are entirely safe.

"2. The limit of 16,000 lbs. fibre stress permitted by the Chicago ordinance is perhaps too large, since marked deflections take place rapidly after this fibre stress has been exceeded.

"3. Steel plates projecting more than two diameters of the hub (or column) beyond it should be designed for deflection, or it would be better to use a cast-iron plate for large loads.

"4. The circular is the most economical shape for a bearing plate."

(To be continued.)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) gives the results with illustrations of the works of the successful students in the annual competition of the American Academy in Rome in architecture, sculpture, and painting. Our contemporary's principal illustrations are of proposed new buildings for Andover Theological Seminary, Cambridge, Mass., of which Messrs. Allen & Collens are the architects, and alterations to St. Clement's Church, Philadelphia, by Mr. Horace Wells Sellers.

La Construction Moderne (Paris) illustrates two premiated designs in the competition for the Grand Prix de Rome, which should be interesting to those British students who are desirous of following the French manner of design and draughtsmanship.

Der Architekt (Vienna) gives several illustrations of the work of Professor Kotera, of Prag, and of his disciples—L. Lauda, Vilem Kvasnicka, B. Sima, and Jan Meyer—which show us the phase of "new art" that is practised in Bohemia. From Vienna are taken examples of business premises and flats by Hubert and Franz Geszner and Professor Otto Wagner.

Zodtchy (St. Petersburg) continues its account of English garden cities, with descriptions and illustrations of Bournville and Port Sunlight.

Stone (New York) illustrates as examples of the achievement of stone a detail of the north portal of the Duomo, Florence, and a detail of stone work at the City Hall of Philadelphia. Several smaller illustrations are given as evidence of the high qualities of Arizona sandstone. Our contemporary draws attention to the admission of an Aberdeen journal that South Carolina granite is now being supplied to Aberdeen itself.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

A Further Open Letter to Sir Aston Webb, C.B., R.A., F.S.A., F.R.I.B.A.

SIR,—Why make any alteration? And who for? Might it be suggested that it would be in the interests of some of the older members of the profession? Just a few names suggest themselves to my mind. Supposing that such an arrangement had been in existence, would the following architects have been so much to the fore in competition work:—Leeming & Leeming, H. T. Hare, E. W. Mountford, Lanchester & Rickards, Warwick & Hall? These are only a few, but doubtless to your readers other names will suggest themselves. At the present time, generally speaking, the best man wins. Long may this be the case.—Yours obediently,

AN UNLUCKY COMPETITOR.

Architects and Heating.

SIR,—My attention has been called to a number of letters which reflect somewhat seriously on architects as a class, which have appeared in your contemporary "Domestic Engineering." I gather from the copy before me that there have been a series of articles, seeking to show that the architect hinders progress in the matter of up-to-date heating, hence the letters.

One correspondent, having recounted an extravagant story of an architect who refused to see him, and, against the wishes of his client, installed a rival system of heating, concludes with the following choice innuendo:—"I dare say that other of your readers have had cause to wonder, as I do, what it is that causes certain architects to prefer certain firms and old-fashioned systems, to other firms and later inventions, even against the expressed wishes of their clients."

I think, sir, you will agree that such an experience is unique, and common fairness should forbid an attempt to tar an increasingly hard-worked profession with such a brush.—Yours, &c.

JNO. LIMEBEER.

Burnham House, Woodlands,
Lewisham: August 30, 1910.

Salaried Officers and Professional Work.

SIR,—Is it not time that the executive of the Royal Institute of British Architects, the Surveyors' Institute, and of kindred societies undertook concerted action in redressing a grievous injustice to the smaller men of these professions?

I allude to the unfair competition arising from the salaried officers of public bodies and companies, the rural and urban district councils, and their respective assistants who undertake, privately, professional work, using their position to obtain this, and in many cases at reduced fees.

The ordinary competition, with the dearth of commissions and increasing taxation, nowadays is sufficiently severe without this glaring injustice.—Yours faithfully,

A VICTIM.

THE Post Office authorities have under consideration the acquisition of Chetwynd House, Stafford, as the site of a new post office for the borough. It is one of the most architecturally interesting of the old houses of Stafford—the former winter residence of the Chetwynd family. The North Staffordshire Field Club has passed a resolution recording profound regret that it should be proposed to take over for utilitarian uses a building of historic interest and an exceptionally fine example of eighteenth century architecture, the destruction of which would be an irreparable loss to the town and county. The Postmaster-General is respectfully urged to consider the selection of some other site, and an appeal is made to the local members of Parliament, Stafford Town Council, and the National Trust for the Preservation of Places of Historic Interest in support of the resolution.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, September 10.

Society of Architects : Sketching Visit to Southfleet.

Wednesday, September 14.

Health Exhibition at Brighton : Organised by the Royal Sanitary Institute. Closes.

Friday, September 16.

Glasgow Coal Smoke Abatement Society Exhibition, September 16 to October 8.

HEALTH EXHIBITION AT BRIGHTON.

THE Health Exhibition held in connection with the Congress of the Royal Sanitary Institute was opened by the Mayor of Brighton on Monday last, and although there are less than seventy exhibitors, there is scarcely a stand that does not contain something new, some improvement on past achievement, even if it be only small. Sanitary manufacturers have now in the main made the giant strides that marked the early days of modern sanitation, and are now engaged in adding the "next-to-nothing" that marks the steady approach to perfection, that goal which we are ever striving to reach, but which is always before us, and towards which our steps become shorter and shorter as each advance is made. There is now at Brighton in the Exhibition, which remains open till September 14, plenty that is interesting and instructive to the sanitarian, the engineer, and the architect.

The central position under the Dome is occupied by Messrs. JOHN GILKES & Co., a Brighton firm, who show two very admirable materials for use in wall covering, for which bronze medals have been awarded. Of these "Tekko" is a wall covering of silk-like effect, non-fading and washable, prepared with a backing of oiled parchment or cotton, on which is a basis of aluminium paint finished in a waterproof lacquer. The effect of this is very charming, and the colours and patterns adopted in the designs are admirably refined and quiet. The other material is Birge leather paper, which simulates with considerable effect the appearance of old leather hangings, and is thus a useful material for wall decoration.

A very clever device is the combined sitting-room stove and cooking range of the "Interoven" Stove Co., which has deservedly obtained a silver medal for a most compact arrangement that can be used as a sitting-room fire or as a kitchen range, with oven and hot-water boiler, a most useful adjunct for a flat or week-end cottage, economical and effective in action, small and compact in form.

Messrs. J. F. PHILLIPS & SON have been awarded a silver medal for the "Cable" system of hot-water heating, which, although its merits are now being extensively recognised, may still fairly be regarded as one of the novelties in heating apparatus. By the use of low-pressure steam and an ingenious "Thermo Syphoniser," working automatically, a hot-water system at comparatively low pressure works with considerable velocity, thus enabling a central source of heat to give adequate distribution at great distances and in spite of dips and other variations of level. The boiler may be above the circulating pipes, and these, in consequence of the acceleration of flow-rate, may be of much smaller dimensions than in an ordinary radiation system.

Another exhibit by Messrs. PHILLIPS is their "Perfecta" system of heating, in which the heating surfaces are supplied by the actual walls of the building. This is the ideally perfect system of heating used in ancient times by the Romans in their hypocausts. We understand that the "Perfecta" system can be applied to walls and ceilings also.

Messrs. J. TYLOR & SONS, to whose exhibit we referred last week, have staged a very good show and have received bronze medals for their "Manor" pedestal valve closet, their "Regal" silent cistern, and their trough lavatories. The valve closet is silent and sightly, working with a two-gallon flush actuated by a pedal-action lever, thus obviating the most vital objections to valve closets, while maintaining their good points. The only fault we have to find is that the seating of the valve being of indiarubber renewal will somewhat frequently be required. The silent cistern is simplicity itself and really justifies its name. The trough lavatory is intended for school use, and is arranged so that the children shall wash in a spray shower instead of running or still water, thus greatly lessening the chance of infection.

Messrs. PACKHAM & SON, of Brighton, show Gibson's patent "K.B." (kettle boiler) kitchener, for which they are the district agents, which has the merits of small consumption and efficiency, with a possibility of use for grilling or for old-fashioned jack-roasting, both in front of the fire, which has no front bars. A silver medal has deservedly been awarded to the "K.B." kitchener.

The Eagle Range and Gas Stove Co. have been awarded a silver medal for their well-known and appreciated Eagle range, which, in spite of its somewhat high consumption of fuel, still maintains its position and reputation.

The Ferrybridge Foundry Co. show some good forms of smokeless grates, which burn either anthracite or coke with efficiency and economy. These will doubtless receive an award from the judges, but whether it will be a silver or bronze medal remains to be seen, as at the time of writing their exhibit is "deferred for further consideration."

The Standard Range and Foundry Co. have been awarded bronze medals for their motor garage hot-water boiler, their improved municipal combination heating and cooking stove, and for the Burkone patent barless fire. We were especially pleased at this stand with the designs of the company's exhibits, which have been specially prepared for them by well-known architects and designers.

A very fine show of faïence work, of high artistic merit, has been arranged by Messrs. CARTER & Co., of Poole, who have been awarded a bronze medal for their leadless glaze. Although, in a health exhibition, this may be presumed to have been given for hygienic reasons, we consider it justified on artistic grounds, as the accidental colour effects of firing leadless glaze are charming beyond description. The quality of design in Messrs. CARTER'S manufactures is of a highly satisfactory character.

One of the finest shows of sanitary ware in the exhibition is that of Messrs. GEORGE HOWSON & SONS, whose white porcelain enamelled fireclay goods are remarkable for their excellence of design and manufacture and for their low price. Bronze medals have been awarded to the firm for a range of urinals, for a bracket lavatory, for a combination hospital bed pan sink and for a bidet,

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but there are several other admirable items of hospital equipment, baths and other domestic appliances.

A silver medal has been awarded to a gas-heated confectioner's oven, made by Messrs. ARDEN, HILL & Co. and exhibited by the Brighton and Hove General Gas Co. This oven is externally heated, and the products of combustion do not come into contact with the baking, while the temperature can be regulated to a nicety and maintained at any point by the aid of a thermometer read from outside.

Among the remarkable exhibits, that of the Metal Jointing Co. takes a prominent position. In their system of lead jointing, accurately formed conical surfaces are formed on lead pipes by special tools; then between the surfaces to be connected thin strips of a special fusible alloy, "Amalgaline," are placed, and this is fused by a blowpipe flame, thus producing a joint neat and almost imperceptible, strong and reliable. A silver medal has justly been awarded to this system.

Messrs. GEORGE JENNINGS, Ltd., have been awarded a bronze medal for their hydro-pneumatic siphonic w.c., which has the great advantage of not requiring more than the normal two-gallon flush for its action, thus meeting the demands of the most stringent water companies or boards. The "Nature" closet is well worthy of wider acceptance for its hygienic qualities.

The British Sanitary Co. have been awarded a silver medal for their capital new and improved self-acting earth closet, which we esteem very highly for its simplicity and efficiency of working.

"Cofectant," the disinfectant exhibited by Messrs. EDWARD COOK & Co., has been awarded a bronze medal, and its merits may therefore be admitted. It is put up for use in a variety of forms suitable for specific purposes.

A silver medal has been awarded to the Horsfall Destructor Company for their refuse destructor with tub feed and a bronze medal for their low-loading tipping van, which is so designed as to be easily filled from the ground and empties by the simple operation of backing the cart against the tipping-beam, thus actuating the patent balanced tip and self-acting tailboard.

Messrs. SPENCER, HEATH & GEORGE have a good show of apparatus for Ling's Swedish system of educational gymnastics as well as of ordinary gymnastic apparatus. They have been awarded a bronze medal for their educational (athletic) diagrams.

Messrs. J. SMITH & SON show the "Hornet" system of hot-water heating apparatus, which, without moving parts, claims to obtain the advantage of rapid circulation and small pipes by utilising the expansion of steam from super-heated water in an ordinary low-pressure boiler.

Messrs. BRISTOWE & Co. have been awarded bronze medals for their Robbins's non-set plastic cement for manholes and inspection chambers and for their vertical bath, a compact fitment of great value for confined situations.

A silver medal has been awarded to Messrs. GODDARD, MASSEY & WARNER for the improved type of their well-known steam disinfector, in which hot air is injected after the steam has done its work.

Moule's Patent Earth Closet Company have been awarded a bronze medal for their earth closet with chucker action.

Izal disinfecting fluid, shown by Messrs. NEWTON, CHAMBERS & Co., has been awarded a bronze medal.

Messrs. CAKEBREAD, ROBEY & Co. have received the award of bronze medals for their magnet lockfast joint and for Stevens's barrel locks, which they exhibit.

A bronze medal has been awarded to the "Ronuk" patent floor-polishing brushes designed for use with the well-known polish of Ronuk, Ltd.

The London Warming and Ventilating Co. show a large number of forms of stoves, self-contained, for burning anthracite or other fuel without other attention than replenishing for long periods. These are "deferred for further consideration" by the judges.

Messrs. WILLIAM HARRIMAN & Co., sole manufacturers of Barron's patent sanitary specialities, have been awarded a bronze medal for Barron's new patent glazed stoneware accessible sink, lavatory, and bath-trap, and show also several other of the Barron specialities.

The double-flushing cistern invented by Mr. C. L. NEWLAND and described by us some time back is exhibited.

Messrs. J. J. G. SAUNDERS & SONS have been awarded bronze medals for an improved drainer and slop-sink and for a bath with shower that are amongst a numerous collection of sanitary goods well shown by them.

The Limmer Asphalte Paving Co. have a good educational exhibit of asphalte from the raw material to the finished product. Their "Lithofalt" and "Lithomac" are "deferred for further consideration" by the judges.

Messrs. COOKSON & Co. have an excellent and instructive show of their lead and antimony products, including some capital examples of wrought lead-work, both practical and artistic.

The Sussex Portland Cement Co. have been awarded a silver medal for the educational value of their cement exhibit, which illustrates the various processes from raw material to the tested article, with the difference in result of the older methods of manufacture as compared with that of the modern rotary kiln, ball, and tube mills. One of the excursions in connection with the Congress is to the works of this company at Newhaven.

The Corporation of Brighton have formed a loan exhibit of high educational value in illustration of bacteriological and other methods of the Public Health Department, of the work of the Borough Surveyor's department, and the Waterworks department.

A very interesting stand is that of the Tintometer, Ltd., on which is shown the apparatus invented by Mr. J. W. LOVIBOND for colour testing of purity of liquids, of pigmentation of solids, and for the quantitative determination of colour blindness. A silver medal has been awarded for Mr. LOVIBOND's colour educator, an improved apparatus for teaching colour in schools, and a bronze medal for the apparatus for quantitative determination of colour blindness.

Mr. W. W. SMITH has been awarded bronze medals for an ingenious cantilever sink trap and for a combined copper and bath installation suitable for cottage use.

ANCIENT MONUMENTS IN WALES.

THE first report of the Royal Commission appointed to inventory the Ancient and Historical Monuments and Constructions of Wales and Monmouthshire and to specify those which seem most worthy of preservation, embraces the period of the Commission's activity from the date of its appointment, the 10th day of August, 1908, to the last day of December, 1909.

The terms of the reference to the Commision were:—"To make an inventory of the Ancient and Historical Monuments and Constructions connected with, or illustrative of, the contemporary culture, civilisation and conditions of life of the people in Wales and Monmouthshire from the earliest times, and to specify those which seem most worthy of preservation."

One of the first matters with which the report deals is the source from which the Commission decided to gather the information required to enable them to fulfil the duties entrusted to them. Besides the personal knowledge of the members of the Commission, who may all be regarded as experts in Welsh archæology, the Commissioners decided to obtain as much information from outside sources as possible. They report that they have found the 6-inch scale Ordnance Maps very useful and informative, but whilst bearing testimony to the general completeness and accuracy of these Ordnance Maps they are not free from errors of both omission and commission, nor can they be expected to be so free since their primary purpose is not the registering of antiquities. These maps then have formed the basis of the Commission's inventory.

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Next in importance and informativeness are the maps and schedules prepared from seventy to eighty years ago for the purposes of the tithe commutation, which not only record such objects of antiquity as constitute physical features of importance, but in the schedules of field names accompanying the maps indicate in the old Welsh place-names hidden and forgotten relics of antiquity to which the topographical titles afford the only clue.

Printed and manuscript material affords some information, but the Commissioners do not find this source of very high value for their purpose. Correspondence with local antiquaries has brought some useful knowledge, and this is being supplemented by an inspection by or on behalf of the Commissioners of the monuments themselves.

What should be included under the term "Ancient Monument" the Royal Warrant for the appointment of the Commission did not define, and this, therefore, the Commissioners had to fix for themselves. Basing their determination on the terms of the Royal Warrant appointing the Commission for Scotland and the divisions suggested by the Congress of Archæological Societies of 1901, the Commissioners have adopted the following classification:—Division I.—(*a*) Tumuli, (*b*) cromlechs, (*c*) meini hirion, (*d*) inscribed stones, (*e*) stone circles; Division II.—Works (chiefly of a military character) constructed of earth, stone, or both; Sub-division—(*a*) promontory fortresses, (*b*) hill forts, &c., (*c*) rectangular camps, &c., Roman or Romano-British, (*d*) castle mounds, circular or horseshoe, (*e*) castle mounts with attached courts (Normano-British), (*f*) homestead moats, (*g*) manorial strongholds, (*h*) ancient village sites, (*x*) unclassified earthworks (dykes, &c.); Division III.—Stone castles (mediæval) and domestic structures; Division IV.—Ecclesiastical structures; Division V.—Miscellaneous (wells, town crosses, &c.); Division VI.—Sites of historic or antiquarian interest; Division VII.—"Finds."

We regret to note that the Commissioners feel that the terms of their reference do not justify them in verifying the existence of any putative antiquities by excavation or exploration, and still less "for the preservation of a monument that a very slight expenditure of properly directed skilled labour would save from imminent destruction." To take the case of ancient monuments, of which the only present indication is a place-name on a tithe map such as "Cae-Sarn," the "field of the causeway," meaning the remains of a Roman pitched road, the Commission's restriction from digging leaves a doubt as to whether the Roman remains still exist.

In their consideration of the claims of ecclesiastical structures to be classed as ancient monuments, the Commissioners are faced with the result of "restoration," by which "many of the churches of ancient parishes in Wales are every whit as modern as if they had been erected within the past fifty years." The Commissioners, however, recognise that "a church consists of far more than its external walls," and although its fabric may have been shorn of all antiquity by restoration, the ancient parish church may still retain in its furniture or its fittings, its decorative features or its sacred emblems, some survival of a former phase of ritual or of worship that may legitimately be included in an inventory of ancient or historical monuments. Hence the Commissioners have decided to appeal unreservedly to the parochial clergy for full particulars of the churches under their care. It is from this part of the inventory to be hereafter published that students of architecture and other forms of mediæval art may hope to derive the greatest benefit rather than from the merely antiquarian divisions of earthworks and prehistoric stone monuments.

In their search for information the Commissioners have addressed inquiries to head teachers of elementary and secondary schools, who from the issue of the circular of the Board of Education, drawing attention to the desirability of utilising local archæology in the teaching of local history in secondary schools, might be presumed to have gathered information on the local archæology of their respective school districts. Up to the date of the Commission's first report these particular inquiries have not met with a very general response.

The Commissioners report that by the refusal of the Lords of the Treasury to sanction the necessary expenditure they are debarred from making any considerable use of the resources of modern photography for the purpose of adding to the usefulness of their reports and of making easily comprehensible the necessarily brief and technical notices in their inventories. This is certainly a subject of general regret, for the usefulness of the inventories as a source of reference for students is certain to be much diminished by the absence of illustrations which would indicate the character of the works inventoried.

By reason of the considerable amount of material already accumulated in the "Transactions of the Powysland Club," the Commissioners decided that the county of Montgomery would be the most suitable locality with which to commence their duty of preparing inventories. The Commission has made good progress with this section of its labours, and hopes to publish the volume of inventories of the monuments of the county of Montgomery in the course of the present year.

We now come to the part of the Commission's report to which Mr. CAROE has taken exception, the question of the preservation of threatened monuments in various parts of the country. The final words of the reference to the Commission, "To specify those which seem most worthy of preservation," appear to us to limit the Commissioners to the rendering of interim reports dealing, as soon as they have ascertained the facts, with any ancient monuments that are known to be, or may be presumed shortly to be, in imminent danger of injury or destruction. The Commission's powers certainly are not sufficient to enable them to take any useful action to prevent or remedy any injury to ancient monuments, and we opine that any attempt to do so would very quickly be followed by a reprimand. It is the duty of His Majesty's Government to give effect to the Commission's report and to rescue their labours from stultification.

The Commissioners have inquired into and now report on three cases of ancient monuments that are or have been in jeopardy. The first of these is the Roman station at Caersws, a site in the county of Montgomery, parish of Llanwnog, and village of Caersws. There is undoubted evidence that here are the remains of a Roman camp, which are included in a farm agreed to be sold to the Montgomery County Council for the purpose of the Small Holdings and Allotments Act. It is satisfactory to learn that the result of the public interest that has been awakened throughout the county by the action of the Royal Commission and of the Committee for Excavation and Research in Wales and the Marches is such that there is every prospect of the preservation of some of the excavated buildings.

The next antiquity that is referred to in the Commissioners' report is the mediæval castle of Newport, as to which they rather weakly acquiesce in the necessity of further damage to an already sadly disfigured remain by the construction of a temporary bridge through the curtain wall of the castle. It is not a certainty that the position proposed for the temporary bridge is a necessity, and hence it would have been desirable for the Commission to have suggested a possible alternative.

Most lamentable of all is the apparently inevitable complete destruction of the great prehistoric camp on the summit of Penmaenmawr, in Carnarvonshire. This, unfortunately, is wrapped up with a granite quarry, which is being worked under lease from the Office of Woods and Forests, the working of which quarry is not possible without the destruction of the camp. The Cambrian Archæological Association has arranged for a complete survey and plans of the entire camp, but the utilitarian necessities of modern times enforce the destruction of the ancient monument that has survived for centuries, and the business-like procedure of His Majesty's Office of Woods and Forests is in direct defiance of the professed object of the Royal Commission.

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NOTES AND COMMENTS.

A FURTHER and second revision of the British Standard Specification for Portland cement has now been issued by the Engineering Standards Committee. Whilst some may be inclined to grumble at repeated revisions of a standard, it must be admitted that in our manufacture of cement there is not as yet any finality, and that two classes of manufacturers are constantly and continually working hard for progress in one of two directions—either to improve the quality or to cheapen its price. Hence there can be no finality in a standard specification. Consider how foolish such a specification would appear if it adhered to the accepted standard of fineness of the days before the tube mill, or of quality before the rotary kiln.

THEN continued experience throws more light on testing operations in particular, and we are glad to note that the committee has the courage to withdraw the British Standard Needle and adopt the generally used Vicat Needle for determining the initial and final setting times of cement. The committee has also decided, as the result of experimental investigation, not to recommend any test of the plunging type for provision against expansion in cold water, considering that this depends upon the setting time of the cement rather than its soundness.

THE standard of chemical composition has been considerably modified with a view to exclude cements other than Portland and to provide an additional criterion of quality. We regret to note that what we consider a high percentage of sulphur is still allowed. This may be an accepted standard as founded on present-day manufacture, but we look forward to the time when our manufacturers will give us a Portland cement that will be reasonably safe for use with limestones in building, which the cement of the present British standard most certainly is not. There is no necessity for the high percentage of sulphur as an elemental constituent of Portland cement, though it may not be easy to eliminate it under present methods of burning the clinker.

AT the exhibition now being held in connection with the Congress of the Royal Sanitary Institute at Brighton our attention was directed, at the stand of the Sussex Portland Cement Company, to one result of the exceeding fineness of our present-day cement that has been rather overlooked. This is the practical impossibility of preventing the cement used in jointing drain pipes from cracking if used neat. In order that the crystallisation on setting may take place without cracking, the function that was formerly fulfilled by the coarser grains of cement must now be taken up by sand, so that the proper method of making joints in drain pipes to-day is by a mixture of one part of cement to two parts of sand, and not by the use of neat cement.

THE Sheffield Society of Artists announces the sending in day for its thirty-sixth annual exhibition of modern works of art as November 5 next. The exhibition is to be open from November 12 to December 10. We note that it will include oil colours, water colours, sculpture, handicraft, miniatures, but that architecture does not appear. It is good to find that handicraft includes examples of metal work, wood carving, jewellery, tapestry, embroidery, pottery, furniture, designs for wall-papers, lace, &c., and that it is thus recognised at Sheffield that Art is not confined principally to painting, with an odd corner for sculpture.

THE report of the Committee on Ancient Earthworks and Fortified Enclosures, prepared for presentation to the Congress of Archæological Societies held in July last, recounts the preservation of antiquities at Comberton, Cambridgeshire; Carmarthen; Saffron Walden, Essex; Swerford, Oxfordshire. On the other hand, under the heading of "Destruction," injury has been reported to ancient earthworks at Swaffham Prior, Cambridgeshire; Aldershot (this on War Department property); Worlebury Camp, Somerset; Coulsdon, Surrey; White Hawk Camp, Brighton; Bincknoll, Wiltshire; and Scarborough. In several of these cases by the activity of the committee and its friends further damage has been averted. Explorations have been carried on at Hockliffe, Bedfordshire; Tattenhoe, Buckinghamshire; Bowen, Cambridgeshire; Cadno Mountain, Carmarthenshire; Coniston, Cumberland; Maumbury Rigs, Dorsetshire; Hamsterley, Durham; Gellygaer, Glamorgan; Aberdovey, Merionethshire; Caersws, Montgomeryshire; Lansdown and Ponter's Ball, near Glastonbury, Somerset; Butley, Suffolk; Beltout and Chanctonbury Ring, Sussex; Old Sarum, Casterley Camp, Bishop's Cannings, and Avebury, Wiltshire; and Elslack, Yorkshire.

A CORRESPONDENT calls our attention to the unsatisfactory nature of the conditions of the competition, limited to architects in Ireland, for new county offices at Navan for the Meath County Council. The sum to be spent on the buildings is not to exceed 2,700*l*. The architect's remuneration for designing and superintending the erection, including travelling expenses, is to be 200*l*. We are glad to hear that the magnificent offer is resented strongly by reputable architects in Ireland, and that the Meath County Council are not likely to receive a large response to their invitation.

THE proposal to crown the steeple at Dundee has for the time being been withdrawn on the understanding that the opinion of the Royal Commission on Ancient and Historical Monuments in Scotland be asked regarding the scheme. This is a very sensible course. Public opinion, and even the opinion of artistic souls, is likely to vary in such cases, and with a reasonable court of appeal in existence it is only wise to take the opinion of that court.

MODERN COLD STORAGE AND REFRIGERATION.

By W. S. DOUGLAS, B.Sc.

XVII.—REFRIGERATION IN HOTELS (*continued*).

FRENCH practice, as far as cold storage for hotels is concerned, is very similar to English, and a typical example is the plant at the Hôtel Chatam, Paris. The installation, illustrated in figs. 51 and 52 (taken from *L'Industrie Frigorifique*), was designed by Messrs. Grimault, Le Soufaché et Felix, and is controlled by one of their ammonia compressors, having a capacity of 41,000 B.T.U.'s per hour at 32° F., and driven by electric motor. In this case, the plant not being on such a large scale as that at the Ritz, it was considered inadvisable to instal an ice-making tank, in addition to the cold storage accommodation, and accordingly the duty of the machine consists simply in cooling the cold stores and the various expedition refrigerators.

Referring to fig. 51, it will be seen that the plant is arranged in two storeys. In the uppermost, forming the basement of the hotel, the cold stores and refrigerators are located, and the machinery, comprising the compressor and condenser, is fixed in the cellar below. In all there are three separate cold rooms (A, B, and C), and four refrigerators (D, D, E, and F), each of which has its independent cooling system controlled by the valves indicated. Hence any individual room can be used if necessary without useless refrigerating work being expended on the others.

Room A is intended for the storage of meats, and with this end in view, it was very wisely decided to cool it by means of a separate cooler (shown in plan and elevation in fig. 51), which consists of wrought iron coils in a compartment partitioned off from the rest of the chamber. The heated air is sucked into this space in the usual manner through a duct running along one of the top corners of the chamber and fitted at intervals with regulating slides. A similar duct for distributing purposes runs along the other top corner, and air is circulated round by means of an electrically driven fan.

This arrangement does not allow of the best possible circulation, but to place the suction duct on the floor would have involved too great a waste of valuable floor space, and it was therefore unavoidably fixed to the ceiling. To mitigate the evil as much as possible, the openings in the delivery duct have been made, as in the Ritz chambers, to face downwards, so that the air is impelled in a certain degree to the bottom of the chamber, whence it can rise past the meat on all sides

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to the suction duct. For renewal of the air when vitiated slide-controlled openings have been made at the top and bottom of the chamber, and a similar opening for expulsion of the air displaced by the fresh supply is placed at the end of the delivery duct.

Rooms B and C are used respectively for the storage of vegetables and fish, and cooling is effected by batteries of expansion coils on the ceilings. In these, as in the refrigerators and in room A, the expansion is direct; that is to

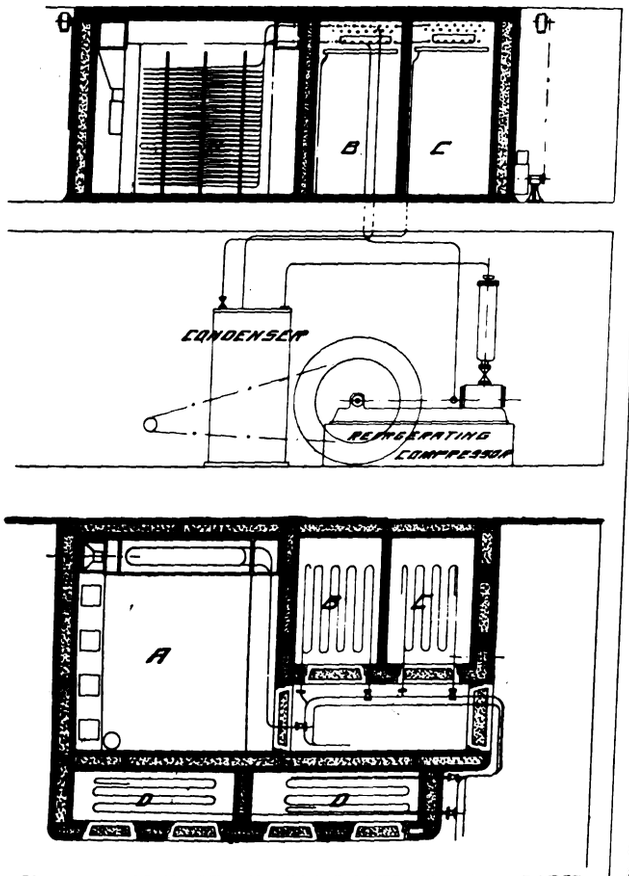


FIG. 51.—COLD STORAGE AT THE HOTEL CHATAM, PARIS.

say, the refrigerant itself evaporates in the cooling coils, under the influence of the compressor's suction, and no intermediate evaporator is required. Consequently all the advantages incidental to the use of this system, which have already been detailed, are obtained, and a bulky piece of apparatus is eliminated.

Refrigerators D open direct upon the kitchen, and are used for storing all sorts of provisions temporarily. They have both, to avoid unnecessary waste of cold air, been fitted with four separate doors, two at the top and two at the bottom of each refrigerator. Cooling is by direct expansion pipes aided, as in the other chambers, by small brine tanks, which store up the "cold" and prevent too speedy a rise of temperature after the machine has been shut down. The replacement of impure air is in this case effected simply by the frequent opening of doors which necessarily takes place. In rooms B and C special shafts have been provided.

The remaining refrigerators E and F (shown in plan and elevation in fig. 52), are at a distance of about 150 feet from the main stores, and are also cooled by direct expansion combined with cold accumulating brine drums. The first named is used for wines and mineral waters, and the second for *pâtisseries*. Both are provided, as usual, with a number of small doors, to facilitate quick handling and economical working.

A notable feature of the plant is the air lock serving rooms A, B, and C. Into this space all the flow and return pipes for each of the three rooms have been led, and, not being insulated, they maintain the lock at a temperature several degrees below that of the atmosphere, although somewhat above that inside the chambers. Consequently the compartment forms a very convenient intermediate lodging place for goods going in and out of the chambers and refrigerators. By its means the meat, &c., can be cooled or heated, as the case may be, gradually, and brusque changes of temperature are avoided, with very beneficial result on the quality and appearance of the goods stored.

It will be noticed that below each battery of pipes, a tray, connected by a trapped outlet pipe to the drain, is fitted, to catch the condensed moisture as it drops from the tubes. To prevent the underside becoming intensely cold, due to the low temperature of this moisture, the trays are all made exceptionally thick, and there is then no danger of damp condensing on the underside and dripping on to the goods below.

The insulation is carried out in a fashion very commonly found in France. It consists of: first, a hollow brick wall of six centimetres in thickness, the bricks being laid on edge; next, fourteen centimetres of charcoal; and finally, on the inside, a second hollow brick wall, similar to the first. This is faced with glazed brick, which gives a clean and neat appearance to the interior, and makes the total thickness up to 28 centimetres, or, approximately, 11 inches. The partitions are, of course, not so thickly insulated, and between refrigerators F and G and rooms B and C, in which the temperatures are fairly equal, the charcoal has been altogether dispensed with.

The refrigerating compressor is of the horizontal pattern, driven by a 6 h.p. electric motor, and above it (fig. 51) is seen the oil separator, which forms a necessary part of an ammonia system, owing to the use of lubricating oil in the cylinder. Close beside it is the condenser, which is constructed on the submerged principle, and consists simply of a circular coil of piping immersed in a vertical cylindrical tank, through which the condensing water flows from bottom to top.

A very important part of all hotel installations, it will be noticed, is the expedition refrigerator. Many forms of this apparatus have been put on the market, but in general principle they are very much the same, consisting simply of a number of small cupboards, having easily opened doors, well insulated, and fitted with cooling appliances. The latter take sometimes the form of brine drums, as in the Ritz Hotel, and are in other cases composed of direct expansion air coils, as at the Hôtel Chatam. For economy and simplicity the brine system is outclassed by the direct expansion, but is superior to the last named in the storage of cold effected, which is specially useful owing to the frequency with which the doors are opened. Direct expansion may, however, be rendered practically equal to brine in this respect by adding to the equipment storage tanks or drums containing still brine.

It is very important that these receptacles, used as they are in connection with the food which people are going to eat, should be perfectly sanitary, and although the ordinary wood construction, finished in hard white enamel, or lined with glazed tiles, is usually found to answer all purposes in this respect, a newer and, it is claimed, better construction has recently been introduced in the United States. The main features on which its claims to superiority are based are the

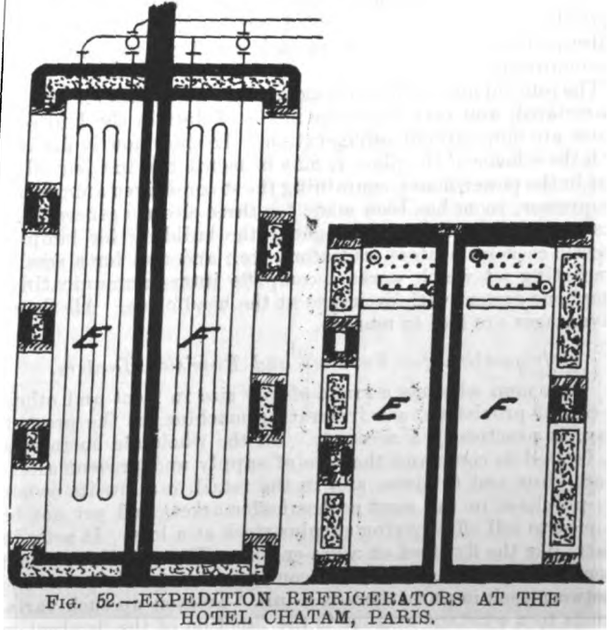


FIG. 52.—EXPEDITION REFRIGERATORS AT THE HOTEL CHATAM, PARIS.

entire elimination of timber work and perishable materials which it involves, combined with the absence of any cranny or crevice which might possibly harbour a grain of dirt. All refrigerators built on this principle have their frames made of steel sections, heavily galvanised, and finished with five coats of white enamel, hand rubbed and baked on. The tops,

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inside and out, and the exterior walls are made of sheet steel finished in the same way, and the inner walls are lined completely with glass. All doors can be made in double plated glass to facilitate inspection, and the insulation is composed of waterproof lith 2 inches thick.

The refrigerators are made in many shapes, some having removable shelves (made in retinned wire), and others drawers in galvanised sheet steel running in brass slides. Nickel-plated brass is used for the fittings, hinges, locks, &c., and the appearance is reported by "Ice and Refrigeration" to be very smart and clean. Certainly, as far as sanitation is concerned, the construction is excellent, but the cost is naturally considerably greater than that of the ordinary refrigerator, and the insulation efficiency is not quite so high. Fourteen refrigerators in this style have, it may be mentioned, been installed in the Hôtel Anthony, Fort Mayne, Ind.

In addition to their use in hotels, small refrigerators of the "Expedition" type, have, in the United States, another most interesting application. They might also, were British builders and house owners not so conservative, and were British summers a little more propitious, be used in the same way in our own country with equally good results. The application referred to lies in their adoption as part of the furniture in each apartment in many of the large blocks of flats so common in Chicago, New York, &c. A typical installation is that at the Lessing Apartments, Chicago, which consist of a main building containing seventy-five apartments and an annexe with thirty-two. Each of these 107 dwelling-places is fitted with a cupboard refrigerator, 20 inches by 30 inches by 72 inches high for the smaller, and 24 inches by 40 inches by 72 inches high for the larger apartments, and in addition there are four refrigerators in the kitchens and one in the café on the roof. The refrigerators each have two doors, one opening into the top division, which is one-third of the total capacity, and the other opening on to the bottom division, which accounts for the remaining two-thirds. At the back of the top part there are direct expansion pipes connected to the suction of an ammonia compressor and partly immersed in water to ensure storage of "cold." This part is therefore the colder of the two. The water is frozen during the eight hours daily run of the plant, and the 100 lbs. ice cake resulting serves to maintain the temperature of the refrigerator in the night time.

In the bottom division a small receptacle is provided to hold ice for table use. This is filled, when required, with 15 lbs. blocks of distilled water ice, manufactured in a tank connected to the compressor, which reduces the temperature of the refrigerator. There are two of these tanks, one having a capacity of 100 and the other of 180 15 lbs. blocks.

All the sets of direct expansion pipes are connected to ammonia "risers," carried from top to bottom of the buildings and through them to the ammonia compressor, the suction pipe line passing on its way through the ice-making tanks, where the ammonia completes its evaporation and freezes the distilled water provided into blocks of ice. There is also a separate bye-pass from each set of coils straight to the compressor.

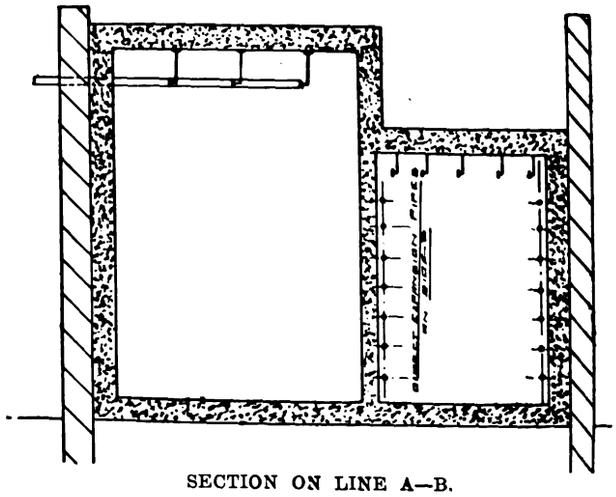
The convenience of this arrangement to the tenants is much appreciated, and very few large blocks of flats in the United States are now without refrigeration. To show how it fits in with the scheme of the place it may be mentioned incidentally that in the power-house, containing the steam-driven ammonia compressor, room has been made for three electric generating sets, supplying current throughout the building for lamps, electric cookers, heaters, radiators, &c., and also for a small generating set which works a complete inter-communicating telephone system with exchange at the head office. All these advantages are free to tenants.

Refrigeration for Butchers and Provision Dealers.

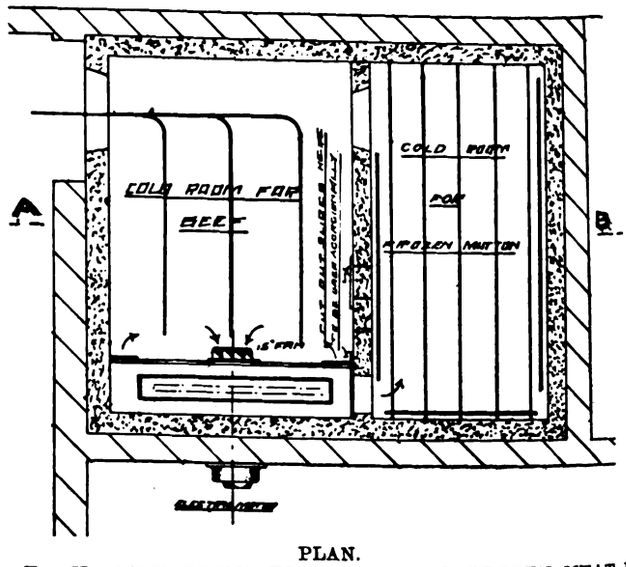
To a man who has a trade of any size in meat and other forms of provisions, a refrigerating machine, at the present day, is practically a necessity. In the wholesale businesses it is used to command the rate of supply and prevent alternate gluts and famines, and in the retail to allow its owner to purchase in the most economical market, and yet not be forced to sell off decaying surplus stock at a loss. It acts, in fact, like the flywheel on a gas-engine. The supplies of meat come in impulses, as large consignments reach port, and between each impulse there is a lull. To even up such variations to a constant average is the function of the flywheel on the engine, and also of the freezing machine on the meat market.

Butchers, with the aid of refrigeration, can now confidently buy large supplies in the cheapest market, and, should their sales not come up to expectations, hold over their meat as stock till a more favourable period. For this purpose, the usual practice is to build a well-insulated cold room at the back of the premises, provided with hanging bars on the ceiling, and, where large pieces of meat are handled, with overhead tracking running right through to the shop or to the place where meat coming from the market is unloaded. The temperature is then reduced to about 35° Fahr. by means of a freezing machine connected up to a separate air-cooler within the cold room, and a continuous circulation of air over and round the meat is maintained by means of a ventilating fan, driven either by belt or by separate electric motor. The air in its passage through the cooler is cooled in the usual way and deposits its surplus moisture on the cold pipes, whence it drips to a lead tray at the bottom and is conveyed to the nearest drain.

For frozen meat the arrangement may be altered. Frozen meat is, of course, Colonial or foreign meat which has been frozen solid at the place of production to permit of its safe passage across the sea. It is stored by the wholesale men on this side in large warehouses near either the meat markets or the docks, and is therefore when brought to the retail man's premises still in a solid condition. Accordingly there is no cooling or freezing to be done, and all that is required of the machine is to keep the temperature of the meat from rising—*i.e.* to overcome the heat leakage through the insulation. Hence it is in reality easier to store frozen meat than meat newly killed, although the temperature to be maintained is lower, being, for the best results, 24° Fahr.



SECTION ON LINE A—B.



PLAN.

FIG. 53.—COLD ROOMS FOR FRESH AND FROZEN MEAT.

No vapours, as explained in a former article, rise from frozen meat, and consequently continuous air-circulation is not absolutely essential. This permits of a cheaper construction, as our air-cooler can be replaced by grids of direct expansion pipes round the sides and on the ceiling of the room. At the same time it is advisable to change the air occasionally, and if two rooms are provided, one for frozen and one for fresh meat, this can quite easily be done by inserting outlet slides in such a way that air from the frozen room can be drawn into the cooler of the room next to it at will.

This arrangement is illustrated in fig. 53, which shows two cold rooms, one for storing fresh beef and the other for frozen

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mutton, erected for the butchery department of a co-operative stores, and cooled by a freezing machine not shown in the illustration. The beef room is placed next the slaughter-house, which is on the left, and the track bars run right from above the killing rings into the cold room, the meat being allowed to remain hanging for some time on the way to abstract the greater part of its animal heat. The mutton room has to be entered through the higher temperature beef room, which thus acts as an air lock, and is provided with light bars on the ceiling to hang the frozen carcases. In the large warehouses, it may be mentioned, these are usually stacked on the floor, with the cloths in which they are sewn up for the over-seas journey still round them.

Cooling in the mutton room is effected by direct expansion pipes and in the beef rooms by a direct expansion air-cooler, fitted with a motor-driven fan, and the device mentioned above has been adopted to change the air, as required, in the freezing-room. The cut-out slides, by which connection is established from the air-cooler to the mutton room, are seen, one at each end of the chamber.

This makes a very convenient arrangement and should be adopted where possible. On no account should one room be used for both fresh and frozen meat, as in that case the lower temperature would have to be maintained, with the result that the fresh meat would become frozen and its texture spoilt.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) reprints by permission from the *Engineering Record* an article on Architectural Acoustics by Professor Wallace C. Sabine. The illustrations are entirely devoted to small houses of modest pretensions as regards cost.

La Construction Moderne (Paris) illustrates a recently erected private bathing establishment in the rue de la Condamine, at Paris, of which M. Louis Fagot is the architect. There are some charming effects in the interior treatment, but the only part of the exterior that is shown, a detail of the entrance, is a weird conception in terra-cotta.

Moderne Bauformen (Stuttgart) continues its admirable series of illustrations of German exhibits at the Brussels International Exhibition, almost entirely of interior decoration and furnishing. This and the preceding number are to be published separately as a conspectus of German art at Brussels. This month's number also includes several illustrations of the designs of Hans Ross, of Kiel-Neumünster, with an appreciation of his work, which excellently combines "new art" with old German feeling.

Zodtchy (St. Petersburg) continues its account of English garden cities, the subjects for the week being Earswick and Hampstead.

Engineering Record (New York) contains an account of the structural steel details in the Ball Realty Building, at the corner of Fifth Avenue and Thirty-fifth Street, New York, a six-storey building with provision for two additional storeys. The remaining articles are rather more of a purely engineering character.

ILLUSTRATIONS.

OXFORD COLLEGE SERIES, LINCOLN.—THE GROVE—BACK QUAD.

By the Rev. ANDREW CLARK, M.A.

(Concluded.)

THE first addition to the buildings came in 1468, when the executors of Bishop THOMAS BEKINGTON added, at the south end of the hall, new rector's lodgings, consisting of a noble living room on the ground floor, a spacious bedroom on the second floor, and a large attic, which the rector often let, as *e.g.* in 1520 to the Archdeacon of Northampton.

We are now able to estimate the accommodation of the earliest College buildings. Besides chapel, hall, library, kitchen, buttery, rector's lodgings, and a fringe of adjuncts, as wood-house, apple-house, dove-house, and the like, they provided in the new fabric some twenty chambers, with their attached studies, and an unknown number of rooms in the attached hostels. Into this building we have to place the rector, some five Fellows, the two chaplains of the two churches, and the common servants—*i.e.* the Bible clerk, the cook, and the manciple. For the service of the Fellows we may add at least five student-servants, receiving instruction, broken meats in the hall, and a bed in their master's room, in return for service. There were thus some eleven chambers in the new building, and all the rooms in the two hostels, to spare. These were let out to graduates, who were called "commoners," because they paid for their "commons," or daily rations, whereas the Fellows received them from the College funds. They, no doubt, had each their servitor to wait on them. We can thus make up a community of some twenty graduates, twenty undergraduates, and three common servants, living within the College walls and following the daily routine of chapel and hall. By College discipline its members were required to go outside its walls as little as possible. They had therefore to make the most of the vacant plots east and south of the quadrangle. In these they contrived to have, in early times, a cook's garden for pot-herbs, bay-trees with seats under them, elaborate gravel walks, rose-beds, and arbours shaded with vines or woodbine.

This peaceful Society was twice in danger of suppression in EDWARD IV.'s reign. In 1462 EDWARD IV. thought of forfeiting it, because founded in the reign of "the Usurper," HENRY VI. In 1474 a legal flaw was discovered in its new charter. To the 1474 crisis belongs the story of the vine and the second foundation. When in Oxford on his primary visitation THOMAS ROTHERHAM, Bishop of Lincoln, was implored by a College preacher, enlarging on the text "Behold and visit this vine," to protect the endangered foundation. He did so right nobly, obtaining a new charter, largely increasing the revenues, building the south wing of the quadrangle (so adding nine chambers with their attached studies), and giving (1480) a definitive code of statutes. As now constituted the College was supposed to provide eight Fellowships for Lincoln diocese, four for York diocese, and one for Wells diocese, the rector to hold either a Lincoln or York place. A by-foundation, by EDWARD DARBY, Archdeacon of Stow, in 1538, was intended to add three Fellowships with narrower preferences. But poverty overrode the provisions of the statutes, and from HENRY VIII. to VICTORIA the College seldom exceeded the number of rector and ten to twelve Fellows.

Undergraduates, destined to become the predominant element in College life, appeared, as has been seen, first as student-servants. The first official recognition of them came in 1568, when a benefaction by Mrs. JOAN TRAPS provided maintenance for four "scholars," who, in return for education for their degree, should wait on the Fellows' table. It was not till 1688, on the foundation of Dr. THOMAS MARSHALL, that any other effective provision was made for undergraduates. Lord CREWE'S addition, begun 1717, of twelve exhibitions of 20*l.* each, was the greatest thing which had been done for the College in its history.

The Reformation settlement, arrived at under ELIZABETH, was fatal to the intellectual life of the College as a society of Fellows. It retained every old restriction, of local qualification, of necessity of taking orders, of proceeding to theological degrees, just when these became meaningless; and it provided no outlet by which Fellows might be induced to quit College and take part in the larger life of the nation. Its redeeming feature was that it brought into College, in increasing numbers, undergraduates desiring tuition, at least wishful to take their degree. Hence it comes that before the end of ELIZABETH'S reign we have an organised staff of College lecturers for the instruction of candidates in the subjects for B.A. and M.A., and for imparting the rudiments of religious knowledge and of Greek and Hebrew. The clearest statement as to the other set of educational officers, the College tutors, is found in 1639, when there are three tutors, having charge respectively of thirty-two, twenty-six, and thirteen pupils. Locality seems to have been studied in assigning pupils to a tutor, the Somersetshire Fellow being in charge of the West of England men, and a Yorkshire Fellow in charge of students from Yorkshire, Notts, and Derby.

The seventeenth century brought a great accession of buildings. In 1609 the old Turl Street hostels were replaced, chiefly at the charges of Sir THOMAS ROTHERHAM,

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an ex-Fellow, of founder's kin, by the west wing of the inner quadrangle. Defaced towards the street by spurious battlements and tasteless gaping windows, this fabric retains on the east its simple charm of windows divided by plain stone shafts, of domestic eaves, and visible dormer-windows. In 1629-30 the visitor of the College, JOHN WILLIAMS, Bishop of Lincoln, built the beautiful chapel, a striking example of Jacobean Gothic of the best type, with four bays of three-light windows of pleasing proportions and exquisite tracery. The glass, which shows twelve prophets in the north windows and twelve apostles in the south windows, with six types and the corresponding antitypes in the east window, is superb in design, colouring, and perspective. The cedar carving of the stalls, screen, and wainscot is of exceptional merit, and retains to this day much of its fragrance. While the chapel was being built the College made a great effort, and scraped together money enough to complete the new quadrangle by adding an eastern wing, a replica of the Sir THOMAS ROTHERHAM wing opposite, providing nine chambers on a staircase and a half. The increment was, however, partly illusory. PAUL HOOD, seventeenth rector, was the first married head, and required larger accommodation than his celibate predecessors. He therefore obtained a half-staircase from Archbishop ROTHERHAM's 1474 buildings and a half-staircase from these 1630 buildings. One of the Plates shows the rectorial corner of the inner quadrangle, with the annexation from ROTHERHAM cloaked by the BEKINGTON rebus, and the other annexation disguised by difference of windows.

The University Commission of 1854 reduced Lincoln College to the uniform type of an Oxford College. The old local preferences for Fellowships and exhibitions were removed and the number of Fellowships reduced in order to increase the number and value of the scholarships.

The College is greatly hampered by the exiguity of its ancient site. Recent additions to the rector's lodgings (1884, Messrs. WILKINSON & MOORE, Oxford), the Grove (see Plate), and the new block (1906, Messrs. READ & MACDONALD, Cork Street, W., see Plate), which provides senior and undergraduate libraries, an archive-room, and a lecture-room, have been found room for only by most skilful economy of space.

ALLWOODLEY GOLF CLUB.

THE Club-house is situated on the Harrogate Road, about six miles from Leeds, and on the high ground between Airedale and Wharfedale. This house was designed to accommodate about 150 gentlemen and eighty ladies. The plan is so arranged that the gentlemen and ladies have each a separate entrance hall, from which there is access to a common dining-room. There is a smoke-room for the gentlemen and a sitting-room for the ladies, each sex, of course, having its own dressing-room and lavatory accommodation and drying-room. There is also a committee room, caretaker's quarters, consisting of kitchen, scullery, butler's pantry and service lobby, and upstairs a sitting-room, three bedrooms and bath-room. In the basement is a larder, heating chamber and coal store. The building is planned with the side wings at an angle of 150° with the main front, so as to enclose the verandah and shelter it as much as possible from the wind. The building is erected of bricks, rough-cast externally, and covered with red tiles. It is of a plain, homely character, the effect being secured by grouping and skyline rather than by ornate detail. The Club-house is warmed by hot water, low pressure, from radiators. Experience shows that this is more suitable than placing the hot-water pipes under the floors, because, in the case of the locker-room, if the pipes are placed under the floors they are liable to cause the clubs to warp by too high a temperature. The drying rooms are heated from the same apparatus, fresh air being admitted at the floor level immediately under the radiators, and extractors being placed in the ceiling. The building is lighted throughout by acetylene gas, the plant being housed in a small hut at the back. The lockers in the dressing-room are arranged in two tiers, the windows being kept up to a height of 9 feet. This is a most suitable method of lighting a locker-room, there being no dark corners, and the whole of the wall space is thus available for lockers. The lockers themselves are 4 feet 6 inches high by 14 inches wide, and 11 inches in width from back to front. A shelf about 8 inches deep is provided in each for balls, &c., and a hook on each door for coats. Holes are bored for ventilation, and a brass plate bearing member's name screwed on. A seat is fixed continuing all round the room, with a shelf underneath for boots, so that each pair of lockers is provided with a boot-rack directly beneath them. The cost of this building, exclusive of furniture, was 2,077*l.* complete. The architect was Mr. ALBERT E. KIRK, A.R.I.B.A.

NEW PUBLIC SCHOOL AT SALT RIVER, CAPE TOWN, SOUTH AFRICA.

THIS design was selected in an open competition for Cape Town architects in 1907, and the foundation-stone was laid by the Chairman of the School Board on September 16, 1908. The buildings were to be designed to accommodate 800 children—560 boys and girls and 240 infants—and the cost was limited to 10,000*l.* In order to ensure greater quiet for the elder scholars, the infants' department has been placed in a one-storey building at the back of the two-storeyed main building. Sixteen class-rooms are provided, each furnished with left-hand light except the "babies'" room; two teachers' rooms, with lavatory accommodation and the requisite cloak-rooms and store-rooms. One of the boys' class-rooms on the ground floor is used temporarily as a wood-work room, pending the erection at a later date of work-shop, gymnasium, and cookery-rooms. Latrines and covered playsheds with drinking fountains are placed in the playgrounds. The climate of Cape Town is so equable and mild that it was not considered necessary to provide fireplaces in the class-rooms. The walls are built of locally made bricks, pointed both internally and externally, and have high brown glazed brick dadoes. The floors are of concrete reinforced with the Kahn bars, and are laid with wood blocks, the ceilings being plastered and whitened. The roofs are covered with English Broseley tiles. Fire-resisting materials have been used wherever possible, and precautions against panic have been adopted. The ventilation has been carefully studied and has proved very efficient; any apparatus requiring constant or periodic attention has been eliminated as far as possible. The cost works out at 11*l.* 10*s.* per scholar, which compares very favourably with buildings of a similar class erected in England. The architects were Mr. W. R. JAGGARD, A.R.I.B.A., of New Barnet, London, and Mr. N. T. COWIN, P.A.S.I., of Cape Town and Pretoria, South Africa; the contractors were Messrs. EDDY BROS., of Cape Town; and the clerk of works was Mr. F. C. MILLS, of Cape Town. The buildings were formally opened for use in March 1909.

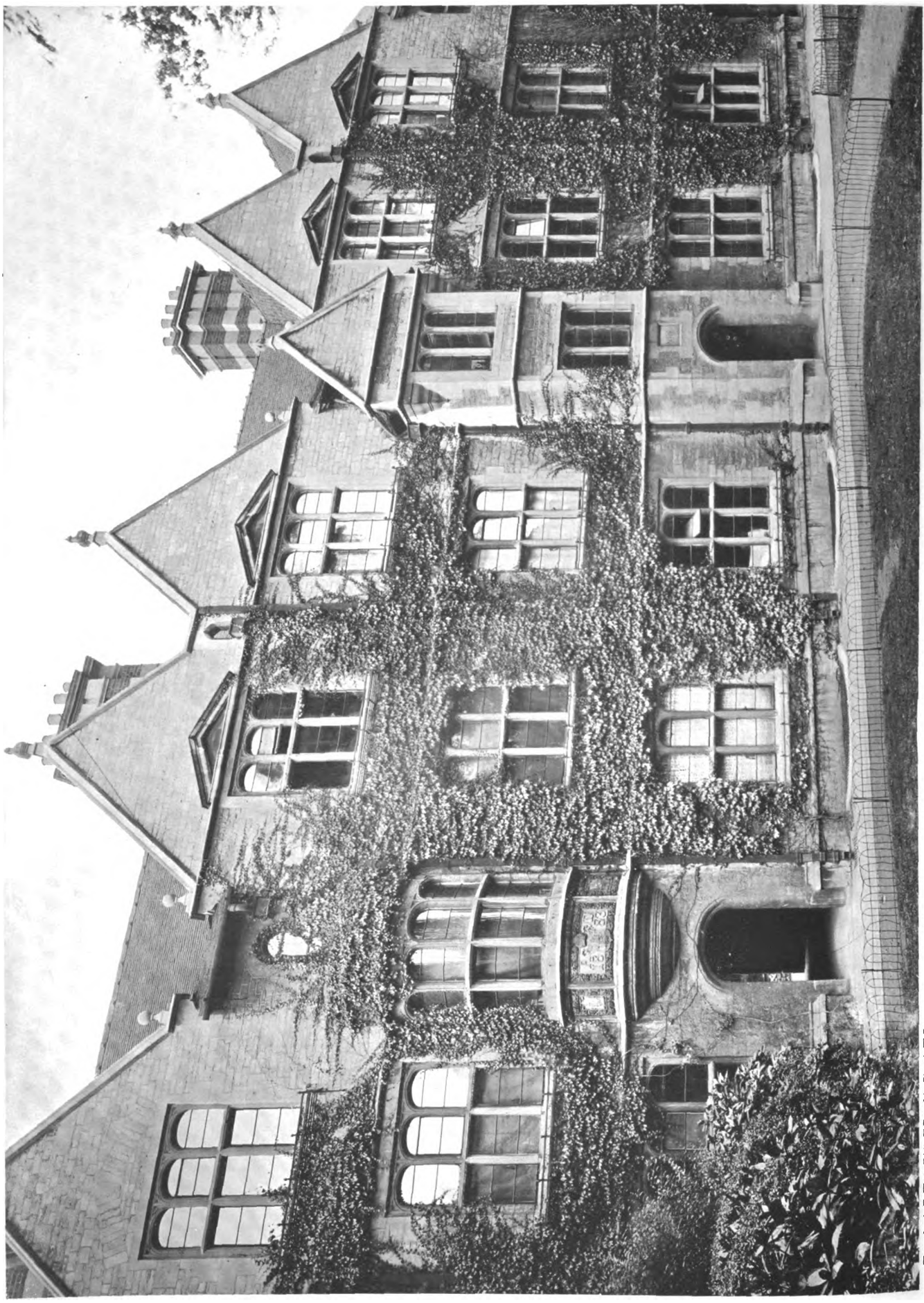
MESSRS. PARRY & BIDDER, civil engineers, Westminster, have prepared a scheme for the construction of a light railway, twenty-seven miles in length between Buckley and Rhyl. The scheme, which is estimated to cost 360,000*l.*, is under the consideration of the Flintshire County Council.

MR. A. VERNON ROWE, architect, Worcester, has been successful in a competition organised by the Worcestershire Education Committee for a new school to be erected at Stourbridge. The plans provide for a school of 308 places, with facilities for future extension by 220 places if required. The cost is estimated at 8*l.* 15*s.* per school place.

THE famous ancient windows in Malvern Priory Church have been inspected by glass experts, and their report states that the three in St. Anne's chapel and the three in the south clerestory of the choir "are in so bad a condition that it would be incurring the greatest risk to allow them to face another winter in their present state. There is practically nothing left to keep the glass in its place. Any severe gale would almost certainly lead to a catastrophe." The re-leading of these windows is estimated to cost 400*l.* It will take some six months to complete. As the result of an appeal by the vicar about 430*l.* has been promised towards the cost, and the work has been commenced.

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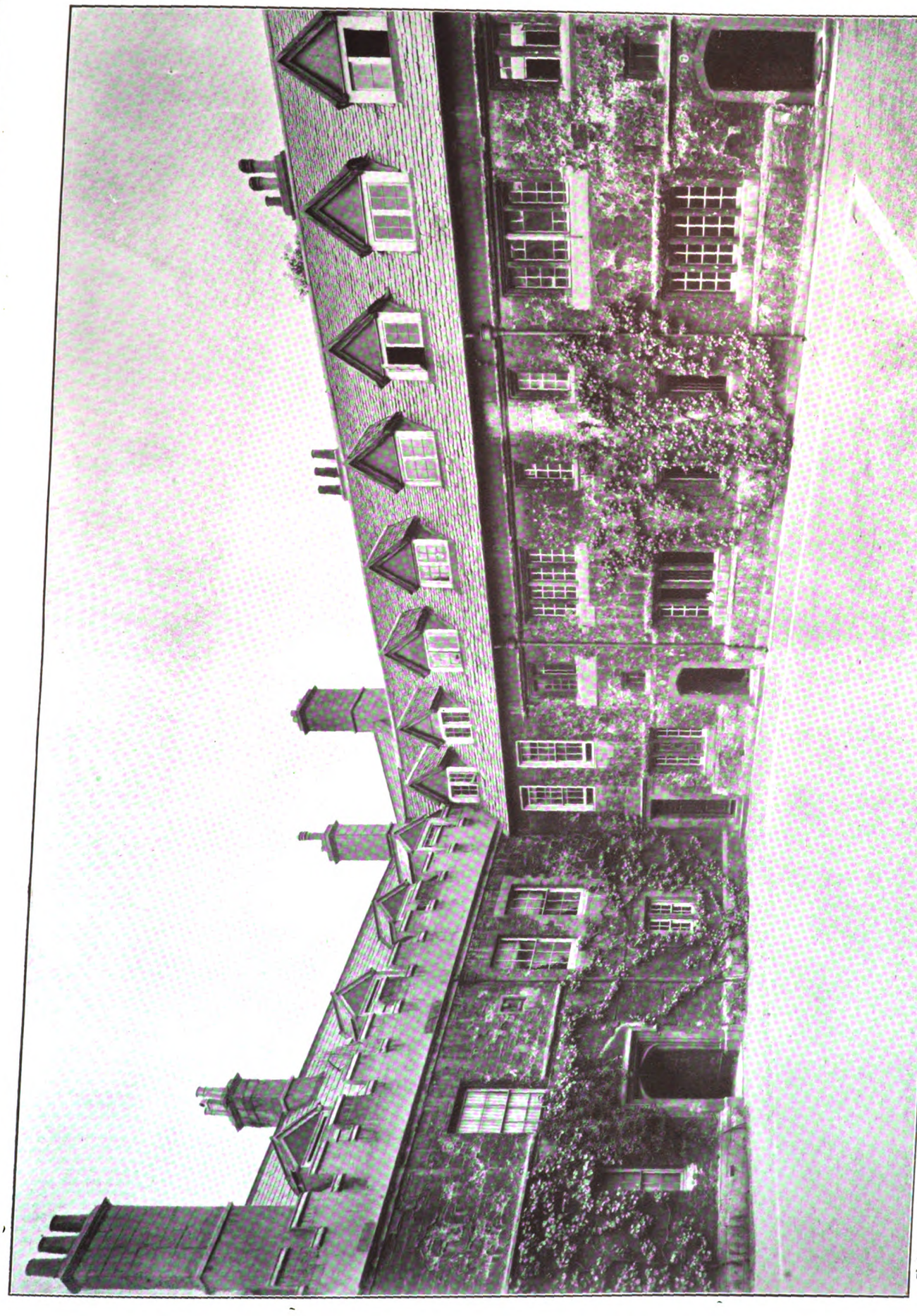


OXFORD COLLEGE SERIES. No. 81.—LINCOLN: THE GROVE.

Photo by A. E. WALKER, 60 Doughty Street, W.C.

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OXFORD COLLEGE SERIES No. 82.—LINCOLN: BACK QUAD.

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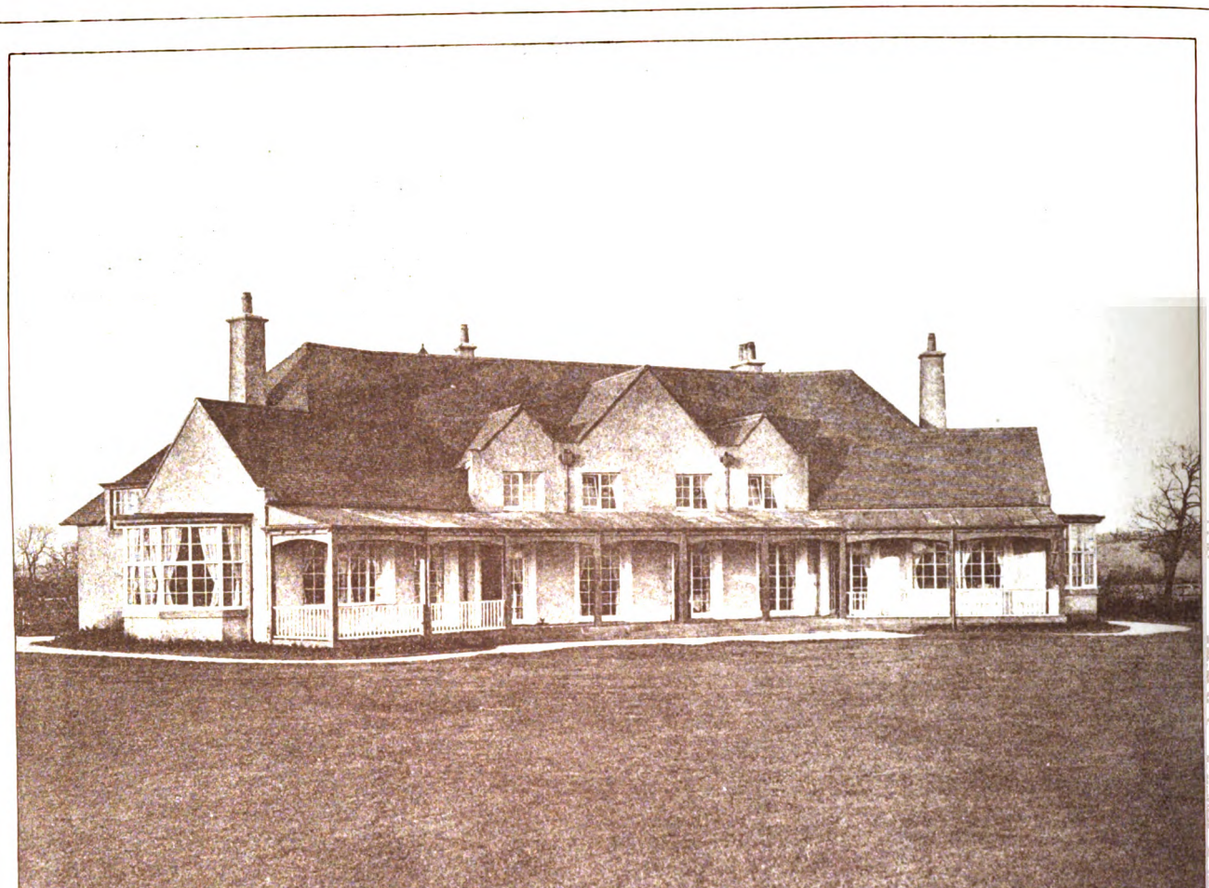
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GENERAL VIEW.



SMOKE ROOM.

PHOTOS BY CHAS. R. H. PICKARD, 5 PARK LANE, LEEDS.

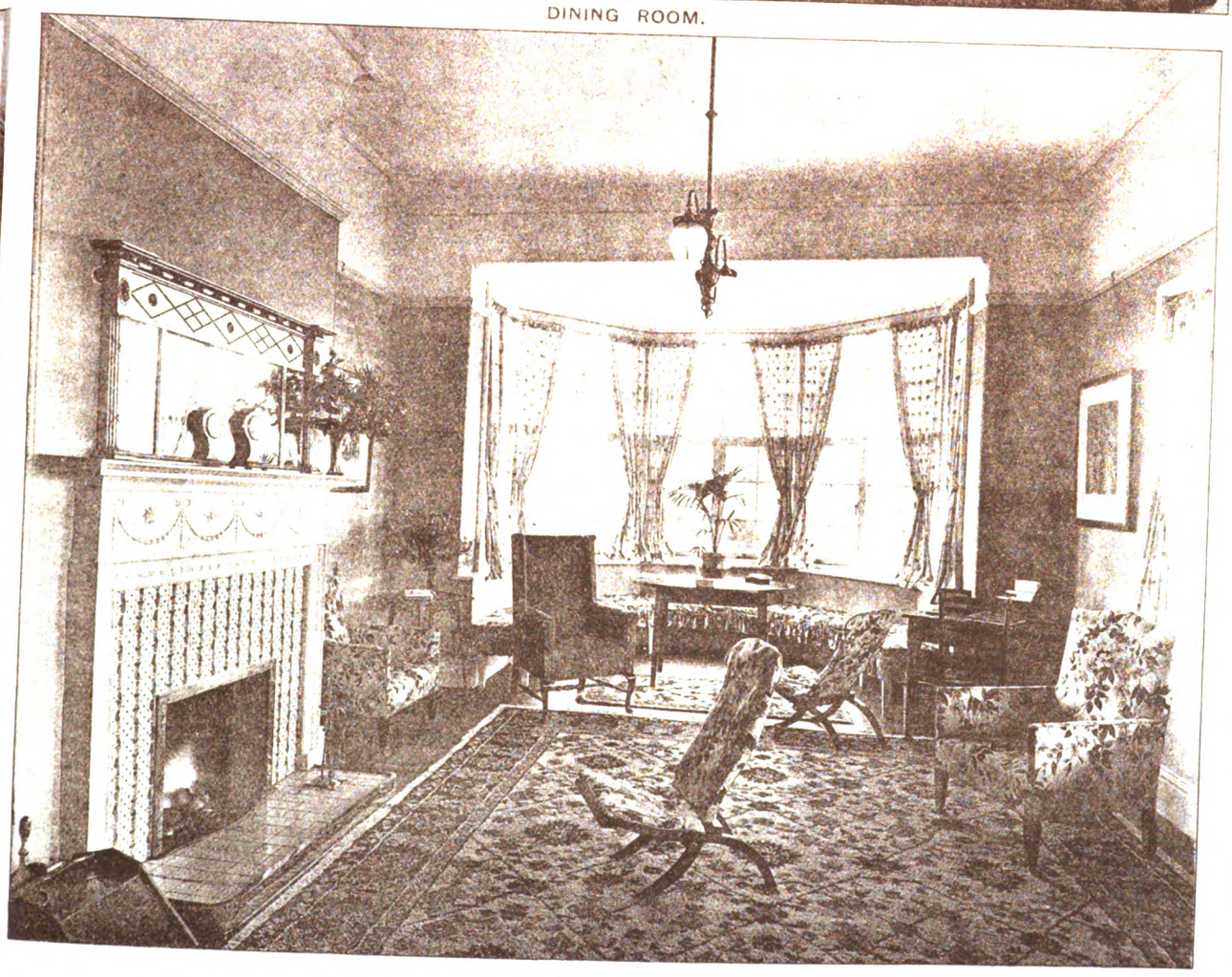
ALLWOODLEY GOLF CLUB

Mr. A. E. KIRK, A.R.I.B.A., Architect

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DINING ROOM.



SITTING ROOM

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GOLF CLUB.

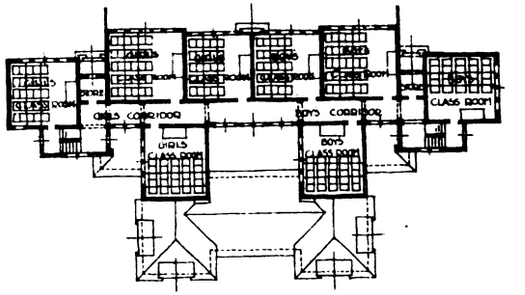
R.I.B.A., Architect.

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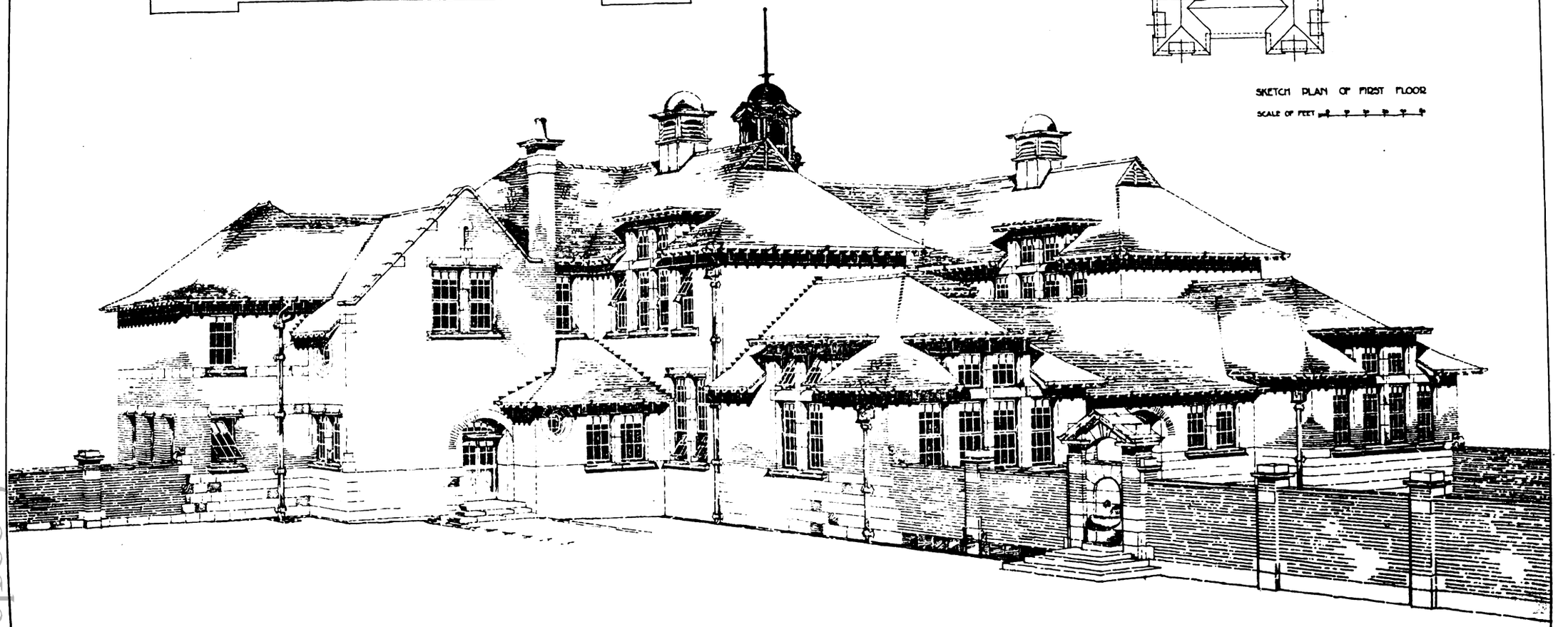
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NEW PUBLIC SCHOOL
CAPE TOWN SOUTH AFRICA



SKETCH PLAN OF FIRST FLOOR
SCALE OF FEET 0 5 10 15 20 25

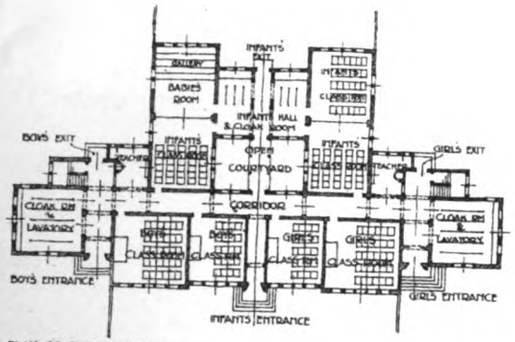


W. R. JAGGARD. A.R.I.B.A. & N.T. COWIN. P.A.S.I.
ARCHITECTS.
LONDON & CAPE TOWN.

W. R. JAGGARD. DELT: 1909.

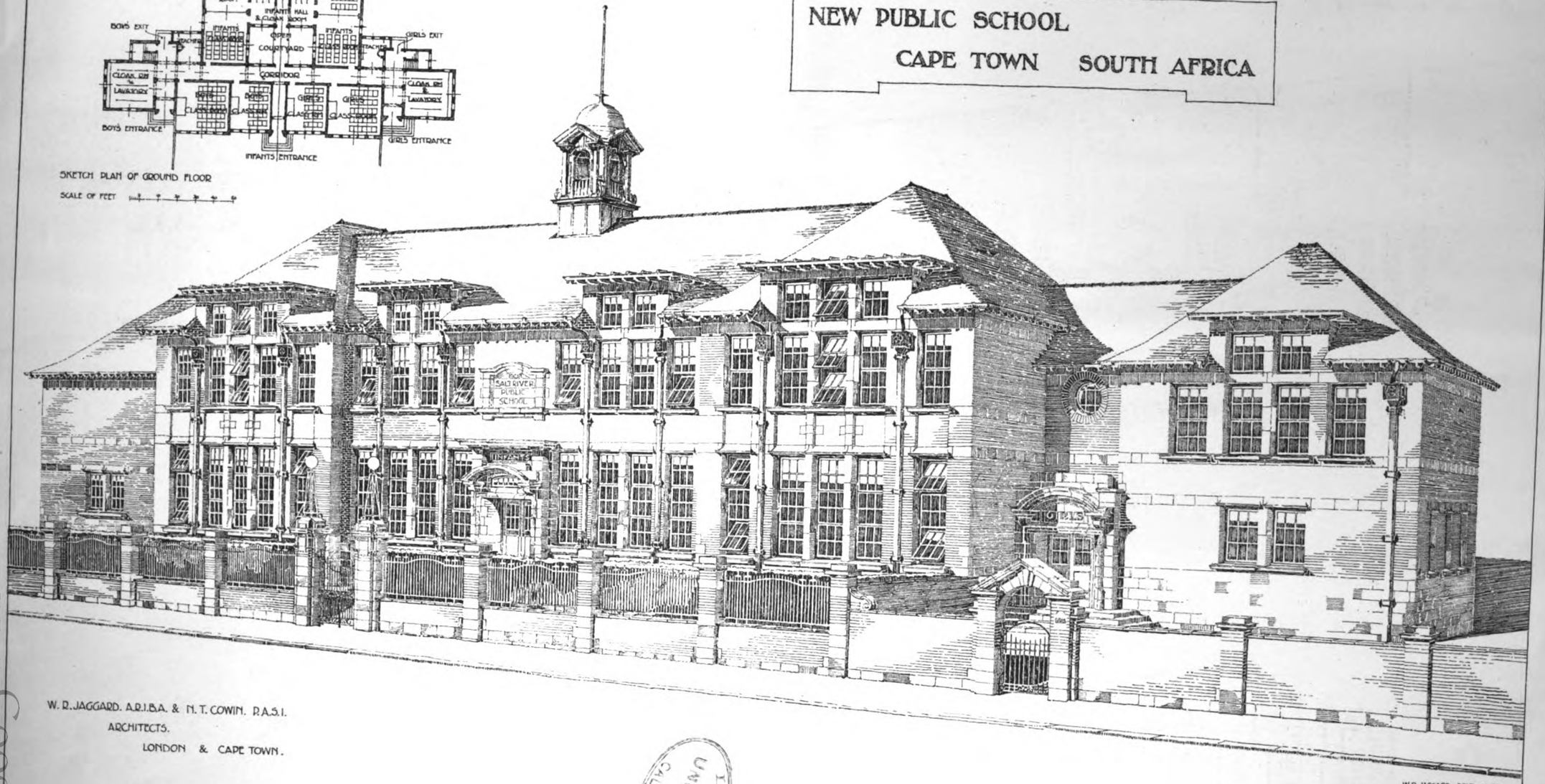
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NEW PUBLIC SCHOOL
CAPE TOWN SOUTH AFRICA



SKETCH PLAN OF GROUND FLOOR

SCALE OF FEET 0 1 2 3 4 5 6



W. R. JAGGARD. A.R.I.B.A. & N. T. COWIN. R.A.S.I.
ARCHITECTS.
LONDON & CAPE TOWN.

W.R. JAGGARD. DELT: 1909.

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ARCHITECTURAL GLEANINGS FROM SOME NINETEENTH CENTURY LETTERS.

(Concluded.)

WHATEVER information Mr. Ballantine, as the intimate friend of David Roberts, was able to give his lordship became the fine gold of the eloquent speech recorded in Mr. Ballantine's "Life of Roberts," where also may be found Roberts's reply.



DESIGN FOR STAINED GLASS—"SCOTLAND."
From Original Sketch by DAVID ROBERTS, R.A.

Lord Cockburn will be remembered as an eminent Scottish judge and a great conservator of the peculiar beauty of the city of Edinburgh.

In a letter to Hay of January 19, 1846, Roberts has some very valuable remarks on Hay's book entitled "Form and Colour." "It has often occurred to me, although I never before mentioned it, that it would greatly tend to simplify it to the general reader, who, judging by myself, am by no means so conversant with the laws that regulate harmony of colour; that, in addition to the diagrams in which the various gradations of colour are combined, if you would illustrate it still further by giving us something of nature's own combinations, such as we see in the endless variety of flowers, insects, and the gorgeous plumage of the feathered race. This, I feel, would bring it home at once to hundreds who are scared and bewildered in first glancing at it in its present beautiful, although, I fear, too learned form. Even in form I think you might carry it further. See the exquisite forms to be found in flowers as well as plants. Take one alone, the fuschia, in which it is difficult to decide in which it most excels, form or colour or both combined. These are familiar to our eye. We love to dwell upon them, without knowing why; a charm steals over our senses as we behold them. Simplify the principle by which they are combined so as to make it practicable to be imitated, and you confer a boon upon mankind. Much, I am aware, must depend upon the education of the eye: it must become familiar with what is beautiful in nature to create what is called taste. In the East, for instance, where nature assumes a gayer form and people wear gay coloured garments, the exquisite taste shown in the combination and arrangement has often made me wonder; and that this extends to all classes is proved by the beautiful harmony pervading small Turkey carpets, which are weaved by the Arab women of Asia Minor, after no pattern but what their own taste directs. Here you never see two alike, and in combination of colour at least, far surpassing anything of the kind we have. If you bring it down to the level capacity of such as myself by comparing or contrasting with these objects in nature with which we are familiar, for one reader now you will have twenty."

Mr. Dyce, R.A., writing on the same subject to Mr. Hay, April 21, 1845, says "that he had been attending to the scientific principles of ornamental form, and had found that curvilinear forms which we reckon beautiful have for their basis—are, in fact—an approximation to scientific forms, such as the circle, ellipse, parabola, hyperbola, cycloid, &c. Curvilinear form is the result of motion, and so, if we could tell the power operating towards such motion, we could determine the curve produced. A stone thrown, for example, produces in the air a line of beauty of the same description as those lines which occur so frequently in Grecian ornament, and which are to be found in the great majority of plants and flowers, and possibly are produced by the operation of gravity, combined with the various degrees and directions of the force of vegetation. I am speaking more of the general and leading lines of the leaves or branches of flowers as correspond with the stem or centre line.

The absolute form of a leaf or flower appears always to have some regular and geometrical basis. Some flowers, for instance, are obviously in one view of them pentagonal, others triangular; but although the motive force of vegetation may seem of itself to turn towards the complete development of such forms, they never are fully developed, but are changed either by attractions of some kind or irregularities in the strength of the vegetative force. The consequence of this, however, is the production of more graceful forms than it may be supposed would otherwise be evolved. For example, a bay leaf, if spread out flat, is of a form that is uninteresting and monotonous, both sides of the leaf corresponding. But it never is seen so. The *twist it* (and all leaves) have gives it the principle of varied and contrasted outline which is so fully exemplified in the human figure—that is to say, the swelling on one side is not opposite the swelling on the other, and the line assumes the hyperbolic or parabolic character."

He further writes, on September 4, 1845:—"My notion

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is that anything must be one-sided which refers natural beauty to any one kind of line. There is no doubt that elliptic curves are largely employed throughout nature, but not, I think, where you see them. So far as my observation goes, the curves which, like the circle, return into themselves occur chiefly in *inanimate* forms and in the *details* of animate ones, the general form of the latter appearing to be universally made by lines identical with, or approximating to, the hyperbola, parabola, &c."

J. D. Harding, a great master of the pencil, a good colourist, and also a delightful correspondent, writes to Hay in November 1845 in opposition to his theory about the ellipse:—"You will find I am right in my assertion that all organic forms in their perfect condition have the ovoid curve." Hay considered that they were combinations of the ellipse.

Roberts, in a letter of November 1849, referring to an ingenious theory advanced by Lord Albert Denison in a work entitled "Wanderings in Search of Health," which was that the presence of curvatures in the Parthenon at Athens makes it seem larger than reality, while the absence of them in the neighbouring Temple of Jupiter causes it to appear smaller, remarks:—"I do not profess to comprehend the latter part of it, as I am inclined to think that the superior magnitude of the Temple of the Parthenon may arise from its altitude, as also of its being surrounded by smaller edifices, which will naturally give it more consequence; whilst that of Jupiter stands on an open plain, with no other to contrast it with."

Roberts asks Hay, in a letter of July 1, 1850:—"Will you let one of your boys sketch me the dome of St. George's, Charlotte Square, correctly; St. Andrew's steeple, and the West Kirk ditto, and your friend Burn's tower of the chapel adjoining?" (St. John's Episcopal Church). This information was needed for a view of Edinburgh which he was painting, as seen from the Castle, and is referred to in a letter to Hay as far back as May 26, 1847. "I quite agree with your friend Playfair that the seeing the Royal Institution from the Castle is a great drawback, but by no means so much as he may expect. It forms a very prominent feature in my picture, and has been immensely admired by the architects and people of taste here. I have some thought of painting a companion picture to this—the view from the Calton Hill, in which his beautiful monument to Dugald Stewart will form the most prominent feature in the foreground; and only fear with my best intention I will fall far short of the exquisite beauty and proportion of the original, for what is beautiful in architecture has the advantage over the sister art of painting. Every few yards forms a new picture; and in the very remarkable position in which this is placed it is to be seen to much greater advantage than if placed on a level."

This second view of Edinburgh he was engaged upon for Robert Napier, of Shandon, as we learn from a letter to Hay dated November 2, 1857, in which he says:—"Again I am painting a picture, rather large, for Robert Napier, of Shandon, from the Calton Hill; but as the studies were made before the erections on the Mound—I mean the Royal Academy buildings (of which the Prince Consort laid the foundation-stone in 1851)—I want one or two memoranda. As it is, will you get one of your clever 'callants' to make it for me at the top of the steps, near to the Nelson monument, the hill road that leads by the base of the rocks on which it stands? If he will give me the outline of it, as seen from this point, as much as comes within the compass of a letter, you will greatly oblige me. He had better take in the Scott monument and the Institution, so that I may judge of the relative proportions beside them." He encloses a rough sketch of the Scott monument and Royal Institution to show what he wants, and adds:—"You will have heard of my presentation to the Academy of my large picture of Rome." The view was taken from the balcony of the hotel in Rome where he was staying on his visit.

In 1850 he is busy on a drawing of Donaldson's Hospital for Mr. Playfair, the architect, and writes on June 21 asking Hay if he can oblige him with some detailed information about the building, enclosing some rough sketches to show what he means.

On September 2 of the same year he remarks:—"I am right glad for Mr. Playfair that the Queen went to see his noblest work [Donaldson's Hospital, presumably]. This must be gratifying to him; and one only wonders that something else did not follow"—knighthood, probably.



DESIGN FOR STAINED GLASS—"ST. GILES."
From Original Sketch by DAVID ROBERTS, R.A.

Referring to his picture of the Hospital in a letter of July 28, 1851, he observes that the drawing "will be forwarded to Playfair about the end of this week. I have treated it artistically, so that, leaving out of the question

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the Hospital as a view of 'Auld Reekie' from the water of Leith, it will have a value. I have painted upon it with a happy, *dreamy* recollection of early days of the Burnside, the Cauldrons, and the Herioter's Pool." The picture is now in the board-room of Donaldson's Hospital.

In a letter of April 13, 1852, to Hay, he says he has "an unbounded commission from the Queen—the opening of the Crystal Palace—in contemplation with which I have had more than one interview—a long one at Windsor Castle, another at Osborne, when I was received with I may say a friendly, as well as a princely, welcome." The picture was finished in 1853.



DESIGN FOR STAINED GLASS—"ST. ANDREW."
From Original Sketch by DAVID ROBERTS, R.A.

He took great interest in the discussion concerning the re-erection of Trinity College Church, Edinburgh, which had been removed to make way for the North British Railway, the stones of which lay for a long time on the south slope of the Calton Hill. It had been an unfinished building of choir, transepts, and crossing in the Scottish Flamboyant style.

It was difficult to find a suitable site for the re-erection, one party wishing the removal of Burn's monument, which stands on the south-east spur of the Calton Hill, placing the chapel on the site; but an influential meeting convened in protest prevented this from being done.

Roberts, in a letter to Ballantine on August 18, 1855, further referring to the site question, remarks:—"I think the more it is discussed it will be found that the site upon the hill is the most desirable, notwithstanding his lordship's regret [the Lord Provost] that the site not being within the parish is a disadvantage. Now one says naturally to himself, Where is the parish? The grand terminus of the two railways seems to have swept the principal portion of it—the High and Low Calton—away; or, if any portion is left, one wonders what they have been doing without it for the last eight or ten years."

David Bryce, the architect, having at length been entrusted with the erection of the church, is, according to a letter of Roberts to Ballantine of April 28, 1856, to place it as its final destination in "front of [Professor] Playfair's monument, instead of the east side of the hill."

It was eventually erected on the opposite side of the valley.

It appears from a letter dated July 8, 1857, written to Hay, that Roberts was nominated one of the seven members of the commission appointed to collaborate with the Board of Works in choosing designs submitted in competition for the War and Foreign Offices; Sir Benjamin Hall, the First Commissioner, remarking that "when I submitted it to a certain high personage, on reading over the list and coming to your name, his exclamation was, 'That is excellent! You must have Roberts.'"

Five of the commissioners were Lord Stanhope, Stirling of Keir, David Roberts, Isambard Brunel, and William Burn.

Neither of the first premiated designs were carried out. The Foreign Office was assigned to Sir Gilbert Scott, who, under pressure from Lord Palmerston, Prime Minister at that time, was obliged to change the very fine Gothic design which he had submitted into Classic of the Renaissance period.

Hay writes congratulating Roberts on this appointment in a letter of May 12, 1857, in these words:—"You have been most judiciously chosen one of the judges for the designs of the public offices, and I cannot help congratulating you on your having received so great an honour. Our friend (Ballantine) is quite pleased that he called upon you lately with a mutual friend, Mr. Rochead, and acquainted you that his motto was 'Anglo-Saxon,' a fact he could not have made you acquainted with now, agreeably to the etiquette of such matters; not that he thinks that in any way it would have had the effect of warping your judgment, but might touch the chord of nationality in your truly Scottish heart to the extent of placing the merits of his friend's attempt in full light and making its faults sink into shade. Mr. R. has a friend in Court, being a pupil of Mr. Burn."

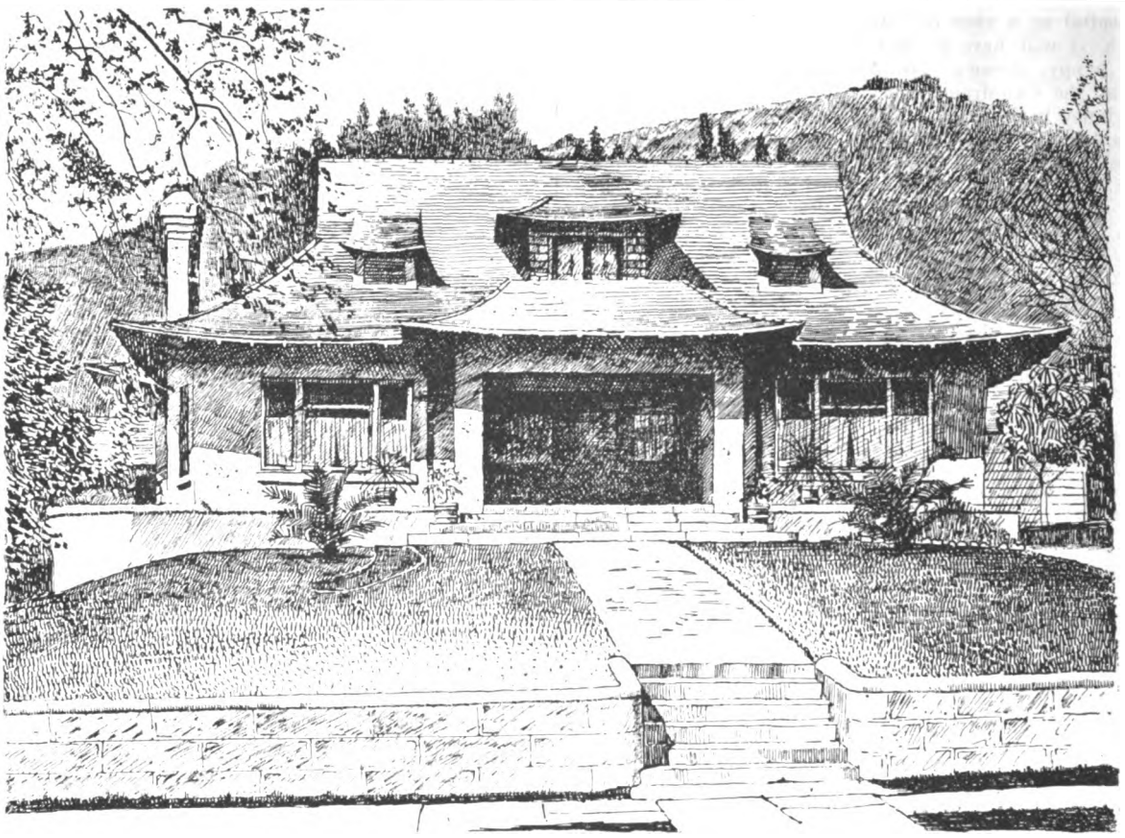
These naïve statements there can be no harm in repeating, since the parties concerned have long passed away. Mr. Rochead was a Glasgow architect of considerable standing in his day, and received a premium for his design, which was in the Classic style.

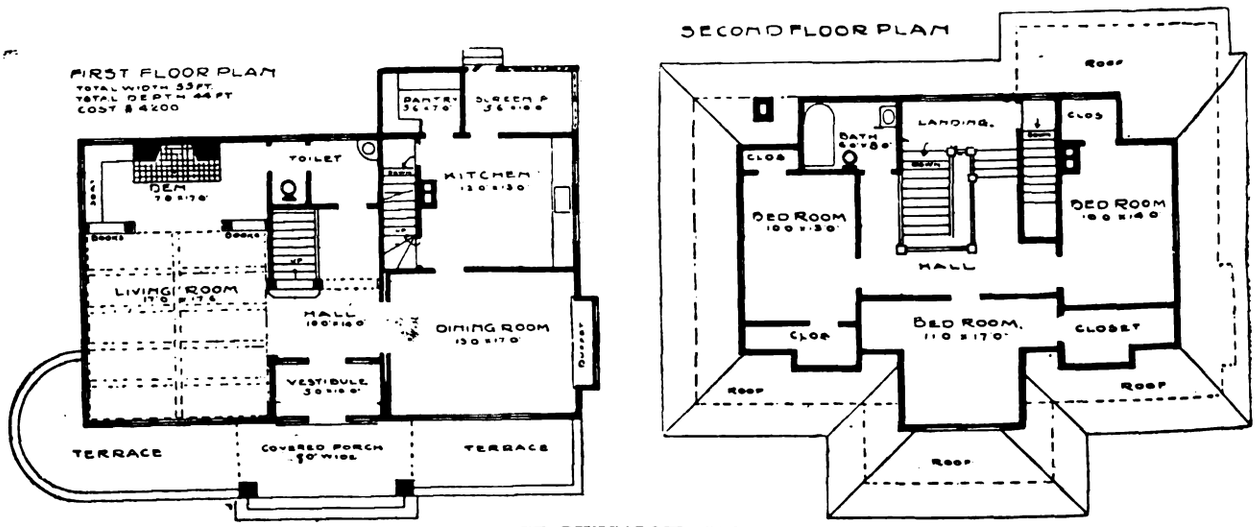
With a few words from other correspondents to Mr. Hay on his theories we may conclude.

Scott Russell, the builder of the *Great Eastern* and designer of the 1872 Vienna Exhibition, writes, September 1846, deprecating the special reference to himself which Hay proposed to make in his volume on "Beauty," but not objecting to an allusion to him as the author of the theory which resolves beauty of form into the three elements of "unity, symmetry and continuity," and the various subordinate divisions which these imply.

There is a letter from Noel Paton of March 4, 1851, written from Wooer's Alley, Dunfermline, in which we find the remark:—"The deepest reflection without some philo-

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CONCRETE BUNGALOW, CALIFORNIA.

sophical basis will no more enable the artist, whatever be the amount of his genius, to achieve a faultless design than will the profound meditations of a lifetime enable the astronomer to ascertain the magnitude and define the distances of the heavenly bodies unassisted by mathematical deductions"; while James Addington Symonds, one of the leading physicians in Bristol at that time, the author of a work on "Beauty" and afterwards of the work entitled "The Renaissance in Italy," propounds the interesting theory in a letter of April 12, 1857, that "One of the causes of the pleasure we derive from looking at forms which can be analysed into harmonic angles, I believe to be derived from the *muscular sense*, and that the eye, in surveying beautiful forms, executed an, unconsciously to us, series of *rhythmical* movements which give the same kind of pleasure as that which is felt in marching to time or dancing—without, as in the latter case, our being aware of the cause of our satisfaction; in short, I would say that the eyes, in traversing the harmonic proportions of a beautiful object, are unconsciously dancing to a visual music."

Dr. Symonds was on terms of intimate friendship with Mr. W. E. Gladstone, from whom he had the following observations on the occasion of presenting him with a copy of his work on "Beauty":—"I have always been a great believer in the substantiveness of beauty, and have thought the counter-argument from variations in the estimate of it both of no more weight than the argument which might be used against the reality of pleasure from similar services"; and then, referring to the architectural aspect, he writes:—"It has occurred to me to suggest to you whether it would not be expedient to make trials of the theory by negative instances, such as Lord Westminster's great bad palace [since rebuilt by Alfred Waterhouse] at Eaton, the new London Bridge with its very flat arches and a slight curve in the roadway, which might be compared with some of the old sharp-arch bridges still remaining, and one or two of the churches built before the architectural revival."

It may not be generally known that the Royal Museum of Science and Art building in Edinburgh was designed on the basis of Mr. Hay's theories of form, and this we learn from a correspondence between him and Colonel Moody, R.E., who had control of the erection. Colonel Moody writes Hay on January 12, 1857, asking if he could draw a musical scale corresponding exactly with the scale of angles enumerated in his book of 1851 on the "Geometric Beauty of the Human Figure," and a musical score corresponding only with the more elementary angles in his last book, "Science of Beauty." These, he said, would "materially assist a certain high personage [presumably the Queen or Prince Albert] in seizing promptly and clearly your elucida-

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tion of the old Greek application of harmony to architecture." He would like to take this up with him to London.

He had written on January 15 desiring to show Mr. Hay the sketch diagrams "of my new building, showing the harmonious angles of which each parallelogram is composed," and is anxious to ask his advice. He wrote on February 13, stating that he had shown the design to the Queen at Windsor and would tell Mr. Hay what was said at the interview.

So that the building as we now see it was designed on a system of angles, approved by the Queen and by the Prince Consort, who, as an able musician, would naturally appreciate the musical analogy.

A CONCRETE BUNGALOW IN CALIFORNIA.

CONCRETE construction has been well tried in America for all classes of commercial buildings, and there is now a general demand for this method in the building of homes. Of recent construction is a bungalow that we illustrate in a quasi-Japanese style; it is inexpensive in detail and yet effective, simplicity being its greatest charm, the Japanese roof giving the building a novel appearance without increasing the cost.

The living-room, dining-room, den, hall, and kitchen are arranged on the ground floor, while the seemingly small first storey contains three roomy bedrooms and a spacious hall. The fireplace in the den and the beamed ceiling of the living-room mark the bungalow style of interior treatment. The two rooms mentioned are really one great room, being separated only by the partition bookcases.

The covered porch flanked by terraces and the tilted eaves give character to the exterior. The house is designed for a plot at least 60 feet wide, and is better adapted to a 75 feet plot. This design has been carried out in California, where the owner built his home for $4,200, using concrete block for the exterior walls, finished with stucco. The interior plaster was applied directly on the block walls. No basement was provided. The interior partitions and floors were wooden, and Oregon pine, costing about as much as Georgia pine, was used for finish. In the middle West this house could be built for $5,000 at the most, carrying the walls down to the bottom of the basement, finishing the basement with concrete floors, and installing a hot-air furnace. The plans are adapted to the use of concrete, plaster on metal lath, concrete block, or brick.

The concrete residence illustrated was designed by Brown Bros., architects, Cedar Rapids, Iowa.

A STUDY OF BASE AND BEARING PLATES FOR COLUMNS AND BEAMS.*

By N. CLIFFORD RICKER, Professor of Architecture, University of Illinois.

(Continued from last week.)

THE cast-iron plates were bevelled on top from the hub to a uniform thickness of ⅜ inch at the edges, the bottom being a plane surface. They were cast and tested in sets of threes of each form. The square plates (fig. 9) were $2\frac{9}{16}$ inches thick beneath the hub; the octagonal plates (fig. 10) were $2\frac{1}{2}$ inches; while the circular plates (fig. 11) were $2\frac{3}{16}$ inches. All cast-iron plates were tested to fracture, which occurred with the load indicated in the figures for each plate. Plates *A* 1, *B* 1 and *C* 1 were tested on the cushion of folded blankets, &c. (fig. 7), which crushed and distributed the pressure unequally, the plate thus failing under a smaller load. The other plates were tested on the wooden cushion (fig. 8).

From the results of these tests, Mr. Dick deduced the following conclusions for cast-iron plates:—

"1. The (preceding) formulas for the design of cast-iron plates may be used with safety.

"2. A greater fibre stress than that permitted by the Chicago ordinance could be used with safety.

"3. Cast iron is better adapted for base plates than steel, as it gives a uniform distribution of the load over the bearing area for a greater range of loading.

"4. Cast iron will not deteriorate as rapidly as steel when in a damp place, and for this reason cast iron should be preferred."

* From a publication by the University of Illinois Engineering Experiment Station.

Mr. Dick likewise notes that the fracture lines pass through the centre of each plate and are not tangent to the hub, as assumed by the preceding formulas. He also suggests that assuming the fracture line through the centre of each plate, the resultant moment of the pressures about this line may be found

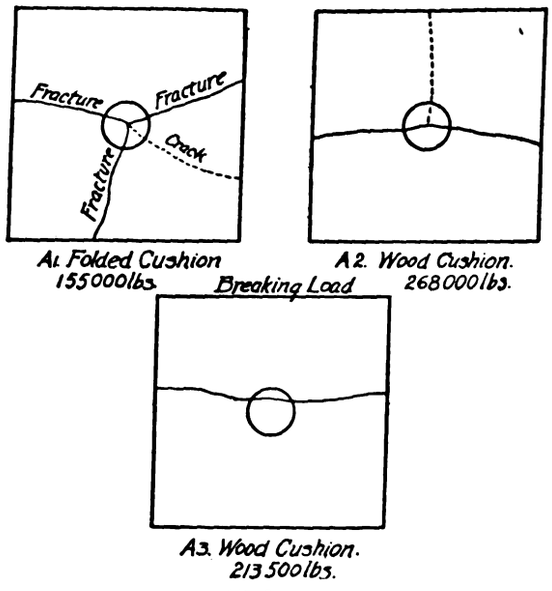


FIG. 9.

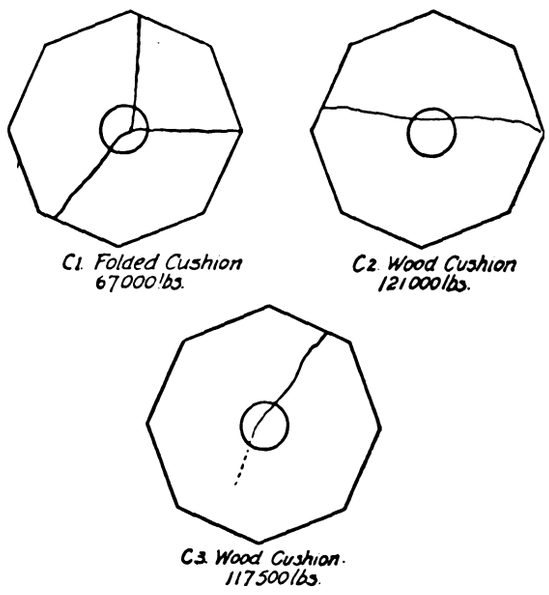


FIG. 10.

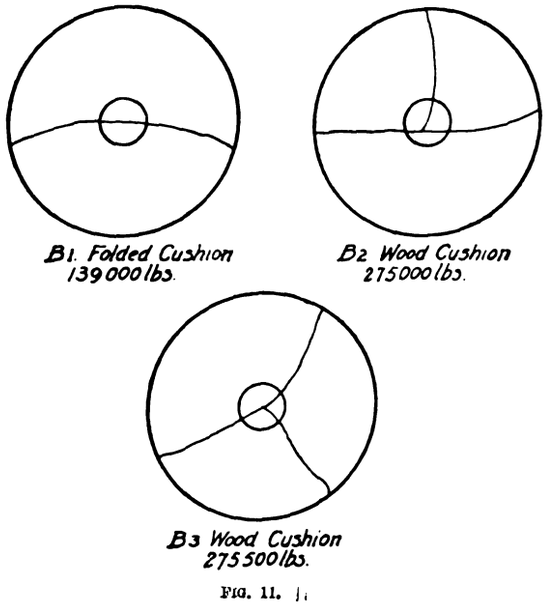


FIG. 11.

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MODERN EUROPEAN ARCHITECTURE.

AUSTRIA.



[From *Der Architekt.*

FIRST PREMIATED DESIGN FOR RATHAUS, MAHRISCH-SCHONBERG.—Herren KARL BADSTIEBER & EDUARD THUMB, Architects.

and equated to the resistance moment of the fracture section. But since this procedure would render the formulas much more complex and increase the labour of designing a plate, the extra abour would not be repaid, being unnecessary for safety.

The direction of the fracture line in the plates tested was sometimes changed by the influence of side cracks, probably due to slight irregularities in the distribution of the pressure, or perhaps to slight flaws in the castings.

VI.—NEW FORMULAS.

The new formulas proposed are based on the following principles, the result of a theoretical investigation and of the nature of the failures of the plates.

1. The line of fracture is a shorter diameter of the plate.
2. The breaking moment about this line is greater than that about a line tangent to the column or hub.
3. The weight of a base plate is very small in proportion to the load transmitted by it, and it may safely be neglected in the formulas.
4. The pressures at the top and the bottom of the plate are then equal and act in opposed directions with unequal lever arms.
5. Their moments about the fracture line being necessarily unequal, their resultant maximum safe moment is equal to the maximum safe resisting moment of the fracture section of the plate.

(To be continued.)

THE Hexham Rural District Council have asked Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne, to report on a scheme of main sewerage and sewage disposal for Riding Mill and Broomshaugh, including the houses in the higher part of the parish.

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PHOTOGRAPHY AS AN ART.

THERE are now to be seen in London two exhibitions which will please the adept and, perhaps, bewilder the tyro in photography. The first is at the gallery of the Royal Society of Painters in Water Colours, Pall Mall East, where the Royal Photographic Society have arranged their fifty-fifth annual exhibition. The other is at the galleries of the Fine Art Society and is the work of the London Salon of Photography.

It is unfortunate that the New Gallery is no longer available for exhibitions; and the Royal Photographic Society deserve sympathy at having to leave Regent Street for Pall Mall East. Their present show is in consequence smaller than usual, for the organisers have upheld a most laudable determination not to overcrowd the walls or to encumber the floor space with screens. Indeed, the restraint and skill manifested in the arrangement of the photographs is a matter on which there cannot be anything but unanimous praise. There may not be the same unanimity concerning the merits of some of the exhibits, which are far from being faithful delineations of the object represented. It was only natural that photographers should quickly tire of producing a mere likeness of an object whether animate or inanimate, and should desire to emphasise the personal equation. And this has now been carried to such a pitch that one is inclined to wonder what has become of the negative. For instance, although No. 58 is called "Bizerta—Evening," it might stand for any place that has a sheet of water fringed by an indistinguishable black mass of buildings with the sloping masts of a couple of vessels breaking the skyline. No. 46 shows "Lambeth Bridge" in such a way that it might easily be taken for a drawing by Mr. Muirhead Bone. No doubt these are the perfection of work in bromoil and ozobrone respectively and they may be both most excellent, but yet they scarcely seem photographs in the old-fashioned acceptance of the term. For skilful manipulation and high æsthetic feeling in selection and arrangement the show is remarkable. These qualities are evident in the portrait studies no less than in the landscapes or street scenes. The present tendency is away from mere architectural photography, which must necessarily seem somewhat mechanical and unimaginative. Nevertheless, carbon prints like "The Norman Crypt" (57) are a delight to the eye. Mr. Arthur Marshall, A.R.I.B.A., has produced in No. 117—"At Leyden"—a work which is considered one of the successes of the exhibition, though this is not due to any skill in the architectural handling. He also contributes "The Bronze Horses of St. Mark's" (143). A most pleasing picture is "A Side Canal, Venice" (28), by Mrs. A. Ralli, which is infused with a stirring play of light, shade, and atmosphere. There are very many others among the two hundred odd prints in the principal gallery which arouse admiration. It should be mentioned that the show closes on September 16.

The exhibition at the Fine Art Galleries in New Bond Street is essentially international. The catalogue says:—"The object of London Salon of Photography is to confine its exhibits to those pictures in which individual artistic aim and feeling have found their expression by means of the camera." The collection is smaller than the one mentioned above, but it follows the same lines, and may be regarded as an equal success. The prices given in the catalogue range from fifteen shillings to twenty-five pounds, both being inclusive of the frame.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

The Berlin Town Planning Exhibition.

SIR,—I read your article on the Town Planning Exhibition in Berlin with great interest, and am pleased that a step has been taken in this direction by Mr. John Burns's Bill for the improvement of our towns, and in holding a conference; but why not also an exhibition in London on the Berlin lines, as, of all countries, England has the most to learn from others in this respect? I am not referring to miniature villages or a garden city for the few, like Port Sunlight, Bournville, &c., but the replanning and modelling of our large towns. After an extended tour of many towns in Germany, to come home to the squat, miserable and mean-looking streets over here is most disappointing. I see abroad cities and buildings being built and laid out on palatial lines—broad main thoroughfares, giving a dignity and effect, with boulevards, and trees in the centre; everywhere, in fact, a *rus in urbe*, noble piles of flats springing up, and economy in space by going upwards and skywards, and utilising to the full the ground, which is laid out on broad lines, in a stretch of gardens for the benefit of all, thus a benefit and economy to the whole nation, instead of two or three-storey buildings like dolls' houses in narrow streets and cramped sidewalks. I cannot but think that if our architects copied this modern flat style of building, suitable for all classes, with the recesses, alcoves, or loggias introduced for gardens or breathing spaces in the buildings, they would become popular, the land saved being laid out in attractive form.

How is it also that in our buildings the ugly roofs are such a prominent feature and are not more hidden, instead of showing a dull skyline of dead drab slate? or, if visible, a relief in colour in this respect could be found in a less sombre tile. In Dresden such colours as green, red, blue and yellow tiling were used in the new quarters like the Nuremberger Strasse.

One sees here so many buildings with no architectural features—bricks and mortar, with holes for windows.

I suggest, too, that there is a meanness or smallness about the architecture, instead of a breadth; the windows are small, mostly of the same type, the French window giving a much better effect than our sash up-and-down window. An exhibition with German models and inviting suggestions for London and Greater London, some of which need not be extravagant, would also be of benefit to provincial towns, so that we are not behind in the race while other countries are moving in this direction. In other words, why not make better use of the land at disposal by going upwards? In our towns we may show a beautiful building in itself, but cannot show much beyond.

In conclusion, I must say that the white houses, either of imitation stone or stucco effect, appear to me to be more artistic than our red brick for town buildings, and do not see why there should be so much prejudice against stucco, considering the greater scope in decoration it gives.—I remain, yours faithfully,

Nottingham: September 3, 1910. F. C. CLARKE.

[We understand that the Congress that is being organised by the Royal Institute of British Architects for October next will have for one of its features an exhibition such as our correspondent suggests, in which many of the exhibits shown at Berlin will be included.—ED.]

Town Planning and Modern House and Cottage Exhibition, 1911.

SIR,—I should be obliged if you would permit me the courtesy of your columns to remind intending competitors that, although the last date for receiving designs in Classes I. and II. is October 31, it will greatly assist the judges if a fair proportion of designs are sent in for consideration before that date.

The entries at present received fully justify the hope that Mr. Raphael's generosity will result in a most interesting and valuable exposition of modern cottage architecture, which should exercise a far-reaching influence on suburb building near London.

It has been arranged to publish a fully illustrated quarto volume, describing the houses and cottages erected with plans and drawings, and competitors are asked to furnish perspective drawings and short descriptions of their work, with the names and addresses of the architects and builders, as soon after October 31 as possible in order to facilitate the preparation of this work.—Your obedient servant,

M. BUNNEY, Hon. Secretary.

September 6, 1910.

A Further Open Letter to Sir Aston Webb, C.B., R.A., F.S.A., F.R.I.B.A.

SIR,—I should like to join in the interesting correspondence on a subject revived by "L," and referring to wasted labour in competitions; I might have written sooner had I not been busily engaged on work, which, though not putting many shekels in my pocket, has at least the merit denied to competitions, of not abstracting many shekels from the pocket.

This perennially ventilated plaint seems never to advance any stage towards amelioration. And as long as there are generous-minded architects ready to subject themselves voluntarily to a period of hard labour plus a heavy fine, it

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is hopeless to expect any improvement. Reform is never in advance of serious demand. Amelioration can only be effected by a strike on the part of all capable men, known and unknown.

This I will cheerfully concede to "An Unlucky Competitor," namely, that by means of the system in vogue, unknown men of genius (or merely of capacity) have received chances that in some very few cases have proved to be the tide in their affairs; and were merely sketches required preliminarily, many front rank men might compete, who do not care to waste valuable time in elaboration. But for the sake of the trifling percentage of fortune-finders, is it justifiable, in the economy of life, to permit such a huge monument of wasted labour to be erected? "Unlucky Competitor" is certainly generous in his views, but I wish I could have a chat with him; I would soon convince him that in competitions, luck or "unluck" has no place, for every assessor, as we know, decides absolutely on the indisputable merits of the schemes, and consequently the best always wins, so that I must commend your correspondent's generosity at the expense of his capacity.

"L" and "M" are wrong, however, in limiting the requirements to sketch plans. I grant that the plan is paramount, but the elevations are not to be neglected or relegated; they should form an integral part of the scheme. Let the assessor therefore decide on the best plans and the best elevations submitted, which the proposed expenditure will justify—even should they be by different hands. I can conceive here a storm of protest arising, but allow me to enlarge on my views. If A submits, as an easy first, the best plan, and at the same time submits an impossible "design" (I have particularly in mind an important metropolitan competition of not long ago) then the assessor should select from amongst the other schemes the best and most suitable "design," and A and B should be appointed joint architects.

Let me go a stage further and suppose (as is possible) that no submitted elevations are good enough. Then, in approving the plans it should be open to the assessor to advise a fresh competition for "designs" based on the selected plans.

Again, I can fancy a protest—"Who is to judge the judge in a matter of design?" I grant a certain justice to this query. And yet, given a wholly competent assessor and you are given one competent to decide on the merits of a design *qua* design. I say nothing as to style—that is another matter. These sketch plans and elevations should, however, be not too sketchy to be accurate and honest. And no perspectives, sir, no perspectives. They are the cause of more petty crimes amongst architects than all the "commissions" of which we do and do not hear.

Apologising for such a protracted letter, and enclosing my name, but not for publication.—Yours obediently,

TREADMILL.

Retford House, North Side, Clapham Common, S.W.

SIR,—This is one of a few very old houses in a terrace, built between 1713-20 on a 200 years lease, which will soon expire; date is over the arch of the house; they were once known as Church Buildings. The architecture is attributed to Wren. This house was once occupied by Granville Sharp (Slavery Abolitionist); a tablet to his memory is in the south transept of Westminster Abbey. Then it served the purpose of a school, and it is stated that Lord Macaulay (the historian), the second Lord Teignmouth, Samuel Wilberforce, and other children of the Clapham sect were here educated. There is a fireplace in the entrance hall here. The house on the left of this once formed a part. "Old Clapham," by J. W. Grover, and "A Sect that Moved the World," by Telford, give illustrations and an account, both books being in the public library, North Side.

September 2, 1910. F. W.

Architects and Heating.

SIR,—We note in your issue of the 2nd inst. a letter headed "Architects and Heating" which refers to *Domestic Engineering* in a way that is likely to do us injury among our many architect subscribers. Your correspondent quotes, fairly enough, from a letter which appeared in our August number, but when he says that the letter was called forth by a series of articles the purpose of which was to show that the architect hinders up-to-date heating, he does us an injustice which we feel sure you will at once put right.

The articles in question are a series of interviews with leading heating engineers and the views expressed are theirs. As in the case of the letter complained of, we are not responsible for the views expressed. Our view is given in the leading article, in which we express sympathy with the architects in an increasingly difficult position.

We trust that you will give our disclaimer the same publicity which you afforded the letter of which we complain. —Yours faithfully,

EDITOR, *Domestic Engineering.*

September 5, 1910.

Messrs. Hobbs & Co.'s Safes.

SIR,—In view of the widespread interest shown by the public in the details of the recent burglary at the premises of Messrs. Wright & Hodgkiss, of Birmingham, we have no doubt that you will be willing to allow us as makers of the safe-door in question to state briefly some of the salient points in connection with the attack made by the burglars upon our work.

We should like to point out that the door was constructed and fixed by us in the year 1883—*i.e.* long before the oxy-acetylene blowpipe in its present form was thought of. The door was, therefore, not specially designed to withstand the attack to which it has been subjected and signally withstood. The door was designed to meet and resist the older forms of burglarious attack, such as drilling and cutting tools, forcing and wedging appliances, and explosives. To enable it to successfully resist such methods of attack the door is strongly built with a series of steel plates of high grade Sheffield-made laminated steel, with a powerful lock chamber and frame. The door is primarily secured by a series of this company's patent "clutch" bolts, operating at three sides of the door, and controlled by a system of locks of special design, viz.:—

(*a*) "Hobbs & Co.'s patent" Violence Protector lock;

(*b*) "Hobbs & Co.'s patent" Banker's Change-key lock;

(*c*) "Hobbs & Co.'s" Keyhole Sealing Attachment, to exclude all tools, keys, or explosives; and, finally,

(*d*) "Hobbs & Co.'s patent" Protector explosive-resisting lock.

The damage done to the door by the use of the oxygen blowpipe is of superficial character, and has not seriously affected the security of the contents of the safe. With all the time and opportunity at their disposal the men engaged upon the attack only succeeded in fusing out two pieces of steel from the exterior plate of the door, the total amount of material removed not being equal in area to the main lock controlling the bolt mechanism, and affecting only one out of a series of four plates. The vital points in any safe are, of course, the locks controlling the opening of the door, and it is evident that the men engaged upon the task were well acquainted with this principle and addressed themselves to destroy them. It is also evident that they quite underestimated the nature of the job they had undertaken and abandoned the attack when they found that their labours were so ineffective.

After careful examination of the tools and appliances, now in the hands of the police, we have no hesitation in endorsing the statement of the police authorities that the outfit comprises the most scientific and practical set of safe-breaking tools and appliances they have yet encountered.

In conclusion, we would like to state that since 1907 we have been manufacturing safes and strongrooms specially designed to withstand the latest weapon that science has placed at the service of the safebreaker, viz., the oxy-acetylene cutting blowpipe.—Yours faithfully,

HOBBS, HART & CO., LTD.,

August 25, 1910. J. PULLMAN, General Manager.

CONDITIONS and maps for the Northwood and Ruislip town planning competition are now available, designs to be submitted by November 15. For particulars apply to Garden Estates, Ltd., 33 Henrietta Street, W.C.

THE Institute of Metals will hold an autumn meeting in Glasgow on September 21, 22, and 23. The general meetings will be held in the lecture theatre of the Natural Philosophy Building, Glasgow University. Papers will be read and places of interest will be visited on the first two days, and for the third an all-day trip on the Clyde has been arranged.

THE Oldbury Urban Council have decided to give notice of their intention to apply to the Local Government Board for authority to prepare a town-planning scheme for the greater part of the Warley district. Replying to a question, the surveyor said the danger they wanted to avoid was that of a number of buildings being put up and then the Council having to spend a large sum of money in pulling them down to carry out a proper town-planning scheme.

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The Architect.

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FORTHCOMING EVENTS.

Friday, September 16.

Glasgow Coal Smoke Abatement Society Exhibition opens, September 16 to October 8.

Saturday, September 17.

Liverpool : The Lord Mayor of London opens the Autumn Exhibition of Modern Art.

Wednesday, September 21.

Institute of Metals : Autumn Meeting in Glasgow opens; three days.

Saturday, September 24.

Society of Architects : Sketching Visit to Waltham Abbey.
Manchester Society of Architects : Visit to Leeds.

Monday, September 26.

Architectural Association : School of Architecture Winter Term begins.
Iron and Steel Institute : Autumn Meeting at Buxton; five days.

THE ROYAL SANITARY INSTITUTE CONGRESS AT BRIGHTON.

THE twenty-fifth Congress of the Royal Sanitary Institute, which was held last week at Brighton, may fairly be esteemed a success. At the closing meeting held on Friday last it was stated by the Secretary that the total attendance at the Congress had been 1,160, and that at the various section meetings seventy-seven papers and addresses had been brought forward and discussed. Seventy firms were represented in the exhibits at the Health Exhibition, and the judges made awards of eighteen silver medals and forty-seven bronze medals, a list of which we gave last week. The attendance of the delegates and the public at the exhibition up to the previous Thursday night had been 6,106.

The Royal Pavilion provided ample accommodation for the business of the Congress, and enabled all the meetings of the various sections to be held simultaneously under one roof. The only objection that could be raised was that in some instances the rooms were too large for the number of members attending the meetings; but as the attendance varies considerably it would scarcely be possible to find rooms that would never be either too large or too small.

As the Royal Sanitary Institute includes within its purview every subject that bears in any degree on health, the papers and discussions necessarily covered a very wide field, and whilst some were of widespread interest, others were minutely technical and specialistic.

In his racy

Inaugural Address

as President of the Congress, the Right Hon. Sir John A. Cockburn, illustrated the catholicity of the Institute's proceedings by touching upon many and varied topics. The keynotes of modern medicine were defined as cleanliness, fresh air, pure food, and prevention of infection. Illustrating these principles Sir John Cockburn tilted at the Englishman's cold tub, of which he said:—"I don't believe in it from the point of view of health. It is not good to come out blue from the bath, but the thing has its virtues." He praised rather the example of the Japanese warm bath and the thermæ of the ancient Romans. Concerning the dangers of impure air, the President pointed out the folly of keeping our houses shut up for fear of the sun spoiling the carpet or smuts getting into the rooms, and condemned the defective ventilation of railway carriages, and especially Pulman cars. The recognition of the necessity of pure food, he said, had brought about the fact that it was easier now to obtain good milk and butter in London than in any part of the country.

In preventive measures against disease, said Sir John, a great change has also taken place; precautions which a few years ago would have been regarded as ludicrous were now the order of the day. Spitting on the footpath was especially instanced, but the President also wanted the habits of dogs controlled. He pointed out how the ghastly spectre of consumption is shrinking under the benign influences of light and air, and the discovery of the work of the offending mosquito may almost be said to have converted the deadly stations of the African coast into health resorts, but he reminded his audience that the problem of syphilis has still to be faced, and the prudery which shrinks from it denotes not a virtue but a malevolent vice which should not be permitted to be triumphant.

Two trades Sir John thought required more stringent regulations, and he caused much merriment by his graphic description of the barber blowing down his neck to remove short hairs and the grocer blowing open a bag in which eatables are to be placed, or moistening his fingers with saliva in separating the papers for that purpose.

In the section of Engineering and Architecture considerable interest was evoked by a group of papers on

Schools.

Mr. William H. Webb presented a paper on "Large Public Elementary Schools in Town Districts," in which he said:—

Speaking generally, the principal differences between English public elementary schools and those of America and the various northern European countries are these: (1) the ground floors for the infants' departments in this country are usually placed at or about the general ground level of the site, whereas those in the countries mentioned are invariably situated at various heights above the adjoining ground level, with a lower ground floor below variously utilised for heating chambers, manual training rooms, play rooms, gymnasia, douche baths, cloak rooms, conveniences, storage apartments, and other purposes; (2) the difference in shape of class rooms, and (3) more ample spacing in class rooms (except in the case of some German schools) than is considered necessary in English schools. Of the first, the necessity for dry foundations, avoidance of ground air and dust from playgrounds, and the better lighting of class rooms is considered of some importance.

As the ultimate size of the school, the accommodation to be provided, and the curriculum are matters of policy and administration, and concern the education authority and its officers more than the architect, I propose to deal with this subject only as regards the grouping or aggregation of large numbers of scholars in the buildings, and their housing and conveniences, &c., considered from a hygienic point of view.

Some of the more advanced education authorities, in addition to well-planned class rooms, generally require provision or accommodation for some of the following:—(1) Medical inspection and waiting-rooms; (2) douche or spray baths and dressing-rooms; (3) manual training-room for boys; (4) work room for girls for the cutting out of garments, &c.; (5) cookery and domestic economy room for girls; (6)

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room of sufficient size for the instruction by the ordinary teachers in educational handwork, supplemental to manual training, for the continuous and progressive instruction of both boys and girls between the ages of seven and eleven; (7) art and music rooms; and (8) suitable plots in the school playground for the cultivation of specimens for nature study.

The number of scholars to be accommodated in each class-room, as mentioned in considering the ultimate size of the school, is a matter of the policy or programme of the local education authority; but it would be well to consider the Board of Education circular No. 709, par. 6, which states that the present maximum number of sixty scholars per room will be subject to further reduction in future codes. For economical planning, therefore, fifty should be taken as a maximum, with grades of class-rooms for numbers ranging from thirty to fifty.

It will be found on examination of English schools that class-rooms generally, in the case of rows of dual desks five in depth, are in shape approximately square, and in the case of rows four in depth, the narrower side is placed to the external or window wall. This arrangement may be attributed to two reasons: (1) the grouping of as many rooms as possible around the three sides of the central or assembly hall for purposes of supervision; and (2) to a supposed economy in cost of construction. The more general use of the forty, or even less number, class-room in this type of school will thus render the questions of lighting and ventilation more difficult of satisfactory solution than before.

The author pointed out that in other countries the class-room was longer and narrower than in England, and continued:—

I believe that this shape of class-room is due to a far wider study as to its hygienic conditions and advantages than the subject has hitherto received in this country. The important gain in the matters of (1) increased direct lighting, (2) increased natural ventilation by external windows, and (3) the nearer proximity of the further or corridor side of the room to the direct rays of the sun are certainly points of importance and well worth consideration.

The subject of ventilation, both mechanical and natural, is one on which much has been written, and is rightly considered a most important and difficult problem to deal with. Of mechanical ventilation the "Plenum" system imported from America is perhaps the best known, but the climatic differences between the two countries do not warrant a system so costly in installation and maintenance being adopted in English schools.

The method of natural ventilation by external windows, fireplaces, and extract flues is apparently the best for school purposes. Windows fitted with properly designed hoppers, centre swing or double hung sashes and opening casements would amply provide the required quantity of fresh air if properly controlled, and no system of ventilation would be successful without the control and co-operation of the teacher. To facilitate the adjustment of windows the most simply controlled gearing is preferable to cords. The subject has received considerable attention and discussion on the part of several authorities, and on many occasions has been before the Royal Sanitary Institute and various other bodies, one of the most recent being the consideration by the Royal Sanitary Institute at the sessional meeting held at Derby in February last, of what is described as cross ventilation as provided in the schools known as the Derbyshire and Staffordshire type of pavilion schools. Dr. Reid, medical officer of health, Staffordshire County Council, is of opinion that school-rooms should be regarded as sanatoria, and this opinion is shared by a number of other medical gentlemen and school architects. That improved ventilation has been secured in the type of school referred to will be admitted, but probably at increased cost of construction and upkeep for heating. Much is to be said in favour of regarding school-rooms as sanatoria in the matter of surfaces to walls and finishings, the avoidance of mouldings in joinery, cornices, boarded dados, cupboards, and cast-iron "art" radiators and other receptacles for the accumulation of dust and dirt, but there are considerable differences in the purposes for which the two classes of buildings are intended, and the method of cross ventilation by bilateral windows introduces another factor into the question of the class-room hygienically considered, viz., bilateral direct lighting.

The research of eminent Continental medical men into the subject of eyesight of scholars conclusively proves that defective sight is to a large measure the result of the bad conditions of the school buildings. Dr. Cohn, of Breslau, as the result of his researches made in 1866, states that in class-rooms lighted under the best conditions 1.8 per cent. of myopia was discovered as against 15 per cent. in badly or inefficiently lighted rooms. The almost general unilateral left-hand and supplementary indirect right-hand lighting in class-rooms in this country, and the quantity of direct window light area per scholar usually provided, leaves little to be desired in this respect. The introduction of cross ventilation by bilateral windows for direct lighting, as mentioned in the case of the Derbyshire and Staffordshire schools, however, produces another evil, and Dr. Liebreich, of Berlin, an eminent school hygienist, has since 1874 rejected this method of lighting. This view is more recently shared by Dr. A. Combe, school medical officer of Lausanne, Switzerland, who gives the following reasons:—One side of an object is more strongly lighted than the other according to the relative distances at which it is placed from the opposite windows, with the result that the shadows are more or less accentuated, and the appearance of the object may be constantly changing. The eye attracted by two conflicting lights seeks to avoid the brighter light on one side of the object, but finds on the opposite side a light varying in intensity, thereby inducing constant fatigue which is likely to result in myopia.

The various regulations as to school buildings in Switzerland stipulate that the anterior windows should not serve for lighting the class-rooms, and this appears to be the general practice in all other countries.

The usual method, in the class of schools under consideration, of constructing the cloak-rooms between mezzanine floors is one that cannot be too strongly condemned, and it can only be on the grounds of economy in the primary cost of construction that such planning can be defended. A visit to one of these apartments on a close, damp day in summer or autumn would amply demonstrate the desirability of some improvement in the proportions of the room and its fittings.

It is most desirable that these rooms should be well lighted and ventilated on one or more sides, and so constructed as to secure the benefits of as much sunlight as the circumstances of the site will allow. They should also be efficiently heated for the drying of clothing and boots.

The cloak-room spaces in American schools are mostly situated in the corridors adjacent to the class-rooms, and in close proximity to the ventilating and heating shafts. In many instances they are placed between the class-rooms, and are accessible from the class-rooms as well as from the corridors; and not infrequently portions of a sub-ground floor are utilised for the purpose. In all cases separate cloak-rooms are provided for each class-room.

In Continental schools a variety of methods exist, those in French schools being accommodated in covered play-grounds, corridors, and sometimes between the class-rooms, as in America. In Germany, Switzerland, and some other countries various arrangements for cloak-rooms are adopted, the corridors sometimes serving as hanging places for garments; but in some of the larger and better schools an arrangement somewhat similar to the English cloak-room is adopted, with the exception that the cloak-rooms are in the nature of recesses formed in the corridor, and with open wire partitions separating them from the corridors.

These, being required by the rules of the Board of Education both for head teachers and assistant teachers, are generally planned as mezzanine floors between the cloak or other rooms on the main floors. Here, as mentioned in the case of cloak-rooms, is room for improvement. Economy in the first cost of building is no doubt the reason for this objectionable method. The rooms are usually insufficiently lighted, low in height, and are most depressing apartments to occupy. It will be said that these rooms are not long in occupation by the teachers, but it ought to be borne in mind that it is in the period when the school is not at work that teachers use these rooms for rest and sometimes meals, and I think rooms healthy, well planned, and efficiently lighted and heated, are as much a necessity for the teachers as for the scholars.

With reference to the placing of teachers' rooms in mezzanine floors, it will be found on examination that these rooms, more especially those between the ground and first, and between the second and top floors, are not in compliance with the requirements of the London Building Act or the Local Government Board's Model By-laws as to habitable rooms and windows.

If anything can be said in favour of the position of these rooms from the point of view of supervision, then I think they ought to be found on the main floors with direct access to the most frequented part of the corridors and entrances to staircases, instead of being hidden away in mezzanine floors.

In England the Board of Education require in the case of elementary schools (though not in secondary schools) that the water closets and urinals for scholars should be placed outside

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the school buildings, *i.e.*, in some portion of the playgrounds. In France, also, this system exists as well as that of placing them adjacent to or inside the building. In America, Germany, and other European countries, they are invariably designed as an integral part of the school building, but with this difference, that those in American schools are mostly found in the sub-ground or ground floors. A plan frequently met with in modern German schools is that of arranging them alongside detached assembly halls or gymnasia (on the ground floor only) approached by short covered ways. Those in various other European countries are more frequently arranged off the corridors, staircases, &c., and adjacent to the class-rooms of the floors they are intended to serve.

There are many advantages in the last method of placing the conveniences, amongst which may be noted (1) the supervision necessary for their perfect sanitary condition is more easily effected by the head teacher and staff; (2) the fittings and appliances are preserved from damage by frost and theft; (3) the possible saving in initial cost of construction and upkeep; (4) the facility of access by the scholars and the consequent saving of school time; (5) the gain in unobstructed playground area; (6) the prevention of nuisances to occupants of adjoining premises; and (7) not the least important, the greater facility of supervision by teachers for the encouragement of discipline and inculcation of more cleanly habits in the younger scholars than is possible in the case of isolated conveniences.

Amongst the disadvantages of placing the offices inside the building the principal, of course, is the difficulty of preventing unpleasant odours pervading the corridors and class-rooms. In a system of water-closets and urinals they should be so isolated as to render them perfectly inodorous, or some such method of planning as is usual in the lavatory annexes to isolation hospitals with cross ventilated lobbies would, I think, be perfectly hygienic.

There should be no reason why a properly constructed, lighted, ventilated, and furnished convenience, so placed as to be under the constant supervision of those in charge of the scholars, should be any more detrimental to health than those usually provided in English schools, which are generally dirty, the apparatus frequently out of order, and at such distances from the school building as to necessitate, in winter months, a scholar, fresh from the warm or over-heated room, crossing the playground in inclement weather, frequently without his or her outer garments. The frequent chills contracted and danger to health of the scholar, as well as the cruelty in cases of sudden illness in so doing, would appear to outweigh any objections there might be to placing the conveniences inside, or attached to the buildings under the conditions previously referred to.

The provision of suitable and convenient rooms for the school medical officer for the periodical inspection of children, with the necessary waiting-room and lavatory accommodation, is an additional item of the modern requirements in school buildings. These rooms should be so situated as to be easily but separately accessible by the children of the different departments, and so planned that the parents accompanying the children may gain access to these rooms without undue interference with the school work or crossing the playground.

It should be borne in mind that satisfactory results of this inspection can only be secured by the co-operation of the parent with the medical officer, and it is important that parents should be encouraged, by the provision of suitable waiting-rooms, to be present at the inspection of their children.

Objections may be raised by some education authorities to the provision of such rooms, on the grounds that they are only occasionally used and add considerably to the cost of the building; but these rooms might be arranged to serve not only the general purposes of medical inspection, but also to be of service on occasions when the school buildings, and more particularly the assembly hall on the ground floor, are used for political or other public meetings, drill purposes (keeping in view in this last respect the possibility of compulsory military training), and the many occasions often found necessary in towns and localities deficient in the provision of places for public meetings.

For the joint purposes just mentioned these rooms should be centrally situated on the ground floor, and easily accessible from the assembly hall and corridors. As to the dimensions of the rooms these will be determined by local circumstances, the exigencies of the building scheme, and the accommodation of the school, but the medical inspection room should be at least 20 feet in length in one direction, and that at right angles to the principal lighting in order to allow of the application of Snellyn's eye-test.

The Wimbledon Education Committee have recently secured an ideal site of two acres for the erection of a new school, and in the preparation of the plans for such school an endeavour has been made to eliminate some of the defects referred to in these notes and to introduce certain of the suggested improvements.

OPEN-AIR SCHOOLS

formed the subject of more than one paper at the Congress, and the approval with which the principle was received by medical men and philosophic sanitarians showed that there is a trend of public opinion in this direction which must strongly influence the architectural design of schools in the near future. Of these papers that by Mr. REGINALD G. KIRKBY on "The Design and Construction of Open-air Schools" was the most important from an architectural point of view. The principal portions of Mr. KIRKBY's paper ran as follows:—

The system of open-air education for debilitated children may now be said to have passed through its experimental stage and to have now become firmly established. The beneficial results attending the experiment and the rapid growth of the movement have no parallel in educational work of recent years.

Children suffering from consumption are now sent to open-air recovery schools, owing to the absence generally of consumption hospitals for children in this country.

Such children, of whom there are a large number, should be treated in specially designed buildings of a residential character apart from open-air teaching schools.

So great are the benefits to be derived from daily attendance at open-air schools for a short period of three to six months that any expansion of the system should be on the lines of duplicating such schools rather than in providing schools of a residential type.

The children usually remain at school for the whole day, which necessitates some provision for the supply of meals, and this should be taken into account in the planning of an open-air school.

These schools are usually closed for the winter months, thereby simplifying their planning and construction. So good, however, were the results which attended the keeping open of the Bradford open-air school at Thackley during the winter of 1909-10 that the desirability of extending their usefulness to the whole of the year is clearly shown.

This school is specially planned to meet this requirement, but it would not be practicable to do this with most open-air schools.

The primary object of such schools is to remove the handicap that surrounds debilitated children, and place them on a more equal footing with their fellows, and to give them a capacity for a fuller and richer life.

The children may in this way be saved from relegation into a school for the physically or mentally defective, and be prevented from becoming a burden to the community possibly for life.

The medical aspect of the work should therefore be of first importance, and the building should be designed somewhat in the nature of a hospital. At the same time the desirability of carrying on such work of a special educational character as is possible in an open-air school should not be lost sight of. Therefore a building to meet all the requirements of an open-air school should in reality be both a hospital and a school combined.

Whilst the local conditions of a particular district may call for some slight modifications in the construction of a building, yet the principles of planning should be generally maintained and the following requirements should be met:—(*a*) Daily rest and sleep; (*b*) provision for teaching in class-rooms in wet weather as well as teaching in the open air; (*c*) physical exercise; (*d*) bathing; (*e*) meals; (*f*) accommodation for medical inspection, and (*g*) the usual offices, which should be specially constructed to meet the requirements of an open-air school.

The special requirements of the building make it no easy matter to obtain a suitable site. The greatest care should therefore be made in its selection. It should be remembered that a well-appointed building may be marred by an unsuitable site and surroundings, and the usefulness of the work of the school may be greatly impaired in consequence.

The school-children are usually collected in batches at some central spot in the town, and thence conveyed (under the supervision of the teacher) to the site. This makes it desirable that the school be placed within easy reach of the town, and near a railway or tramway. Otherwise the mode

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of transit would have to be by means of some special conveyance, which might add to the cost of working the school. If the town be a manufacturing one, the site should be as far removed from the smoke belt as possible; and in all cases the school should be on the windward side of the prevailing winds, so that it does not receive the used-up polluted air which has passed over the town.

A southern open aspect is essential in order to obtain as much sunshine as possible.

The schools should be provided with protection on the northern half of the compass, and also be protected from the prevailing winds. This protection might be obtained by placing the building in proximity to a clump of trees or a wood, to which the children could have access for nature study, &c. Suitable land should be available for the laying-out of gardens and for purposes of out-door drill and play.

Water supply, drainage, and lighting should also have careful consideration, and, where found possible, connection might be made to the existing town's supply.

The prescribed daily rest in the open air will necessitate the provision of deck chairs, specially constructed so as to allow of the children lying in a much more recumbent position than is possible in ordinary deck chairs.

During the warm, dry days the children could wrap themselves in rugs and lie on the ground, but this would not, of course, be possible in wet weather.

For rainy days some necessary protection overhead during resting time will be required, and for this purpose large open resting sheds should be provided. These might consist of a roof open to the apex, supported on piers, to allow the free circulation of air. It would be an advantage to have the back and one side closed in to give some protection against rain and strong cross winds.

Physical exercise in dry weather would naturally be conducted in the open air, but on rainy days, and particularly in winter time, the resting sheds would adequately meet this requirement.

The planning of the class-rooms for formal academic instruction calls for special consideration, as it is essential from the nature of the school that this should be given practically in the open air, although in class-rooms; at the same time it is necessary to provide sufficient class-room accommodation to house all the children at one time.

At Thackley the class-rooms are arranged in two blocks, each consisting of three class-rooms, for boys and girls respectively. The floor area is on a basis of 20 feet per child instead of the usual 10 feet required for elementary schools. Adjoining, and opening out of, each class-room is a teaching verandah, to which the teacher may take the children out for instruction even on rainy days, providing, of course, the weather is not too cold. The verandahs are protected from the north and westerly prevailing winds and rains. Another method of obtaining this result is adopted in the plans of a new cripple and deaf school about to be erected at Bradford, in which the principles of the open-air school are to be followed. Each class-room opens on to a verandah on the south side, the verandah being sufficiently wide to prevent the rain from reaching the scholars while at lessons in the class-room. Casement doors opening outwards are provided for the full length of the room. The verandah is fitted with a glass roof so as not to obstruct the light in the class-rooms, and opening windows are placed above the verandah roof.

The class-rooms should be provided with ample ventilation hoppers and tipplers to allow the room to be frequently scoured with fresh air. To ensure this the means of access from one class to another at the rear of the class-room might also be in the form of a verandah, with a low roof. Ventilating hoppers could then be made to open directly on to the verandah, with tippler ventilators placed above, opening directly into the open air above the verandah roof. In an exposed site the verandah, even if closed as a fresh air corridor, would still leave the direct cross ventilation into the open air above the corridor roof.

It is necessary to provide sufficient bathing accommodation to allow of each child being bathed at least once a week. A bathroom to accommodate up to twenty at one time would appear to be sufficient for a school of from 100 to 150 children. Shower-baths appear to be the best, as they allow the water to run away from each child, and so reduce the risk of contagion from any disease. Troughs might be provided in which small children could paddle, as the effect of the shower might cause the very little ones to dislike the bath. The showers should be just above the children's heads, with a separate ring spray for each child. Each section of three or four showers should be under separate control, and all fitted with a regulating thermometer valve, so that water can be supplied to any desired temperature. The walls should be lined with white tiles or brick; the room will be well lighted and ventilated, and everywhere the idea of cleanliness should prevail.

A system of drill could be adopted in the bath whereby all the children would soap the head at one time, and then the arms, &c., the showers coming into play between each soaping drill. This might be arranged in rows of four to six over a trough, with the floor raised between the trough, to enable the teacher to inspect the children without standing in the water.

A slipper bath will be found to be necessary in which to wash some of the children who on arrival at the school are found to be too dirty to go under the showers with the other children.

Separate dressing compartments should be provided so that the children do not dress all in one room, a practice which is particularly objectionable to older girls who require more privacy. The divisions should not be higher than the shoulders of the average child to enable the teacher to look into its compartment and so easily supervise the dressing and undressing. A curtain at the front will provide all that is necessary in the way of a screen.

The accommodation necessary to provide for the daily meals should be centrally placed in the buildings, so as easily to serve all departments, and should include dining room, large kitchen, store-rooms, larder, &c. The kitchen should provide sufficient accommodation to enable the three daily meals to be prepared and cooked, and should be provided with a large scullery, as in addition to the ordinary work of preparing the meals, the children will assist in turn in the preparation and cooking of the food, and also in washing up the dishes, &c.

The dining room should be capable of seating all the children at one time, with ample space for passing between the tables, so as to enable the children to be taught to lay the tables, and provide for those who take part in serving at the table.

The dining room and its adjuncts should comprise a separate block, as it is not desirable that the smell of cooking should reach the class-rooms, &c.

It is necessary that the cloak-rooms and lavatories should be well lighted and ventilated, as if these precautions are not taken the atmosphere of these rooms is likely to become very foul.

Each child should be provided with a separate towel, hung in a separate recess, thereby preventing the towels from touching each other. This is more necessary in an open-air school, as a towel common to a number of children is likely to be a means of spreading disease.

While gardening should provide some lessons of manual instruction, it may be deemed necessary to include a room fitted with benches, &c., for the teaching of woodwork, &c.

A room, or rooms, might also be included for the teaching of housewifery and needlework. These, with the rooms for manual instruction, might form a separate block.

In addition to the necessary teachers' room, a room for the nurse and medical inspection is desirable if the school be some distance from the town. This room is to be fitted with a sink and lavatory, and also with ample cupboard accommodation. Such a room would facilitate medical inspection, which necessarily forms an important part of the work of such a school.

The buildings which have been specially erected for the use of open-air schools have hitherto been more or less of a temporary character, consisting chiefly of wood framing, covered with boarding or sheet iron. This temporary character is, no doubt, owing to the fact that the open-air school movement up to the present has been "on trial," and authorities have not dared to erect permanent buildings whilst it was in its experimental stage. Now that the principles of open-air schools have been firmly established, a more permanent type of construction is necessary, as it has been found that it is not really economical to erect a temporary class of building for this purpose. From the nature of the work of an open-air school it is not essential, however, to adopt an expensive type of construction, and some form of construction is desirable which is lasting, and yet not costly to build.

At Thackley, Bradford, the walls are only three inches thick, and yet are waterproof, fire-resisting, and permanent. The outside is rough-casted, and the roof covered with red tiles.

(To be continued.)

THE Pontefract Corporation are to make application for a loan of 10,000*l.* for the purposes of a new elementary school.

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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

ALTHOUGH the number of drawings sent in for August is small, they are all of a very high quality, both as regards the character of the work selected and the care and skill exhibited in the measurement and draughtsmanship. We have had some difficulty in selecting the best. We are very pleased with the improvement that is shown by our contributors to the work of the club.

Mr. A. E. BROOKER has chosen the east gateway of Somerset House, designed by Sir WILLIAM CHAMBERS, and hence well worthy of study. Mr. BROOKER's work is carefully measured and figured, and well drawn with a sufficiency of details and a good perspective, if somewhat too much of a diagram.

"Loidis" sends a very complete set of measured drawings of the entrance gateway to Harewood, Yorkshire, a mansion designed by JOHN CARR, of York, which was visited by the Architectural Association on their excursion this year, and described by us in our account of the proceedings. The gateway entrance is shown in plan, elevation, and section, with details, and the author has also given plan and elevation showing the approach to the gateway with the charming little lodges that form part of the composition.

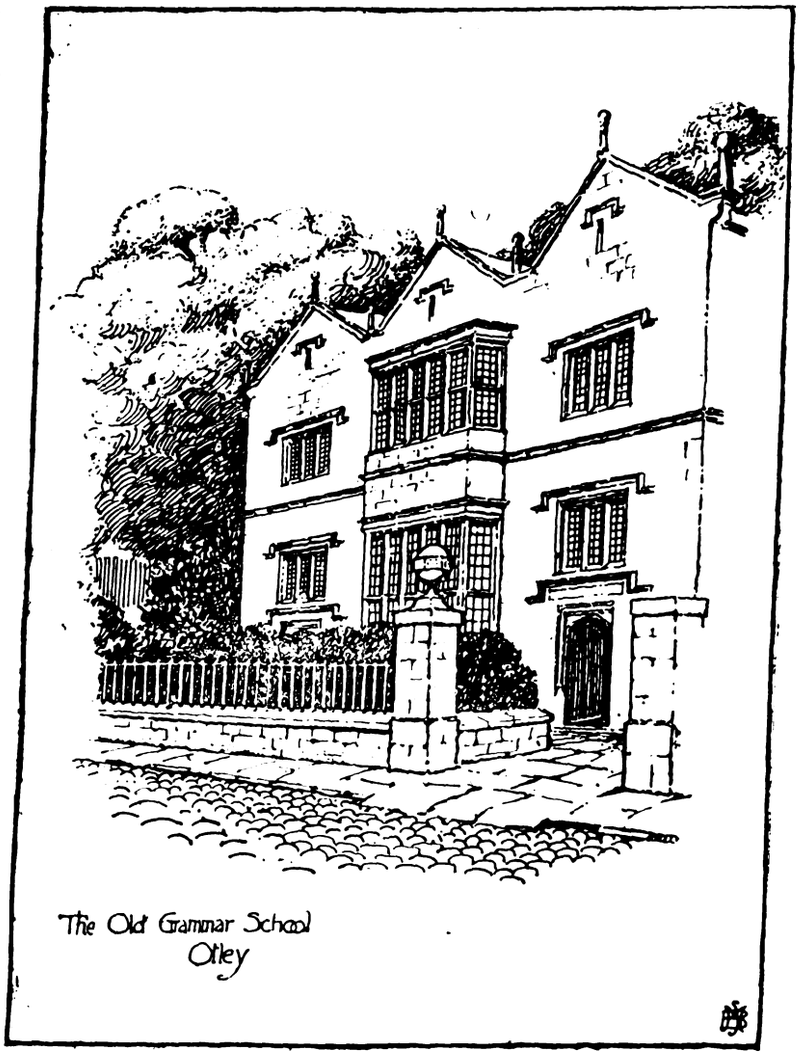
"Sans Peur" has selected for measurement the entrance gateway to "The Chantry," Ely. This is a simple piece of work, consisting of two piers and a pair of wrought iron gates, and is accompanied by a good perspective sketch.

"Hawk" contributes a full set of drawings of the entrance to Farnley Hall, near Otley, Yorkshire, which, like the approach to Harewood, is an effective piece of scenic composition, with curved walls leading to the main entrance, and with flanking lodges set at a tangent to the curves. The design is hardly so purely Classical as CARR'S work, but makes up for this by its picturesqueness of grouping. The drawings are well executed and carefully measured.

"Caledon" has measured the entrance piers of the gateway to Nottingham Castle, which are out of the vertical and lack the gates to support which was their purport. It is hardly wise, and savours of affectation, to attempt to indicate the decayed stonework by drawing with a wobbly line. The pen and ink perspective sketch is well executed.

We hope that now the holiday season is over we shall be favoured with more numerous contributions in the near future.

We have awarded the prize for August to "Loidis."



The Old Grammar School
Otley

THE SPIRIT OF THE DALES.—II.
AN ESSAY ON YORKSHIRE HOUSES.

SO having arrived without delay in the Yorkshire dales at the beginning of the seventeenth century, when James I. was king, I must find some point from which to begin a rapid survey of the old stone houses which we find there, and which almost without exception were erected during the next hundred years. For although Yorkshire, like Cæsar's Gaul, is divided into three parts, the said parts are much too bulky to handle conveniently.

I have no time to dwell on the rural districts round Sheffield or to take you to Woodsome Hall, near Huddersfield. I must perforce omit many an old house I have seen in the "Heavy Woollen district" (a very euphonious name), and I must not, unthinking, stray over the border into the land of the Red Rose. So I will make no more apologies, but lead you straight to Otley, a little town in the middle of the dale-country, partly because I know it well, partly because it is an excellent centre for my purpose.

Otley has but little celebrity, and lying as it does only six miles from Ilkley, it is seldom visited by the tourists who congregate there. Yet there is this difference between the two towns: Ilkley in Roman times was of some importance, and then sank to the level of a rustic village till its recent resuscitation as a health resort and a residential suburb for busy Leeds and Bradford manufacturers. Ilkley probably does less work per head than any town in Yorkshire, and its male inhabitants are absent for most of the day. The result is a certain lack of local interest.

Otley, on the other hand, lives on the industries of many kinds which are carried on within its gates and on the market which has flourished here without a break since time immemorial. And to any antiquary the glamour of age hangs about its streets and dispels the first disappointment of finding the tall chimneys and ugly mills which mar so many Yorkshire towns.

Here the curfew used to toll till recent days; here from the times of the Danes till the Victorian era the Archbishop of York was Lord of the Manor, and here he often resided; here was always an important centre all through the Middle Ages and since, and here has always been the capital of Wharfedale.

In the seventeenth century Otley divided with Leeds the honour of being the largest town of the neighbourhood. Of this period various buildings remain, and one, the Grammar School, appears at the head of this chapter. It was founded in 1602 by a Wakefield worthy named Thomas Cave, and we find in its motto a punning allusion to his name, "Deum Pave, Tomo Cave" (Fear God and mind thy Book).

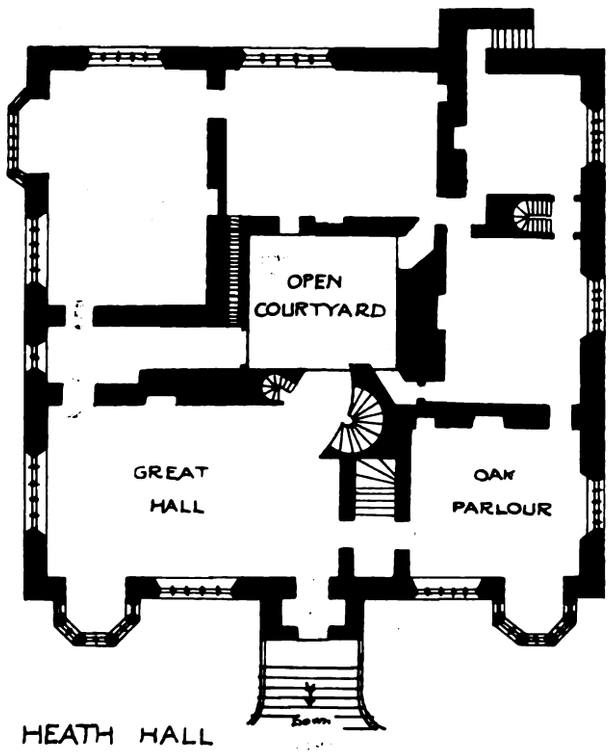
All round Otley are old houses of this period—Newall Old Hall, which has been so sadly dismantled within the last year or two; Farnley, with its fine porch and famous pictures; Weston, with its many-windowed front and beautiful gardens.

But to me the most typically Yorkshire in style and the

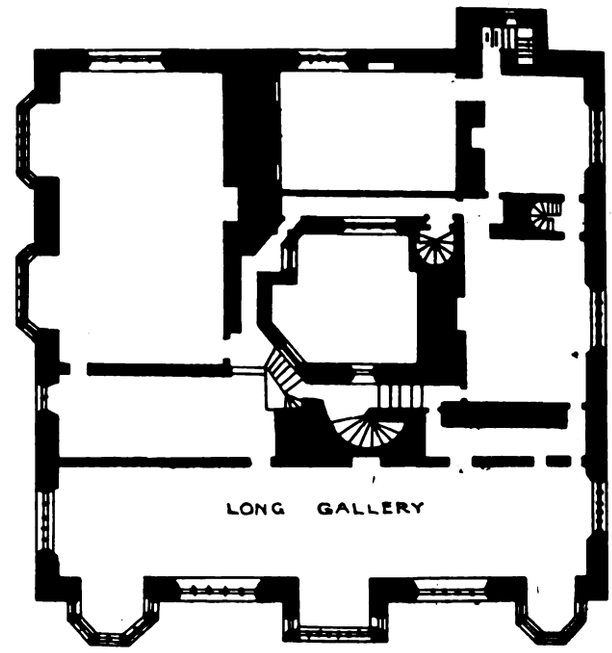
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most worthy of careful study is that old hall which stands gaunt and lonely on Washburn side, across the valley from Fewston.

Swinsty Hall would have delighted Emily Brontë's fancy if she had known it, and she might without straining her wonderful imagination have woven some weird and



HEATH HALL
PRINCIPAL FLOOR AS BUILT

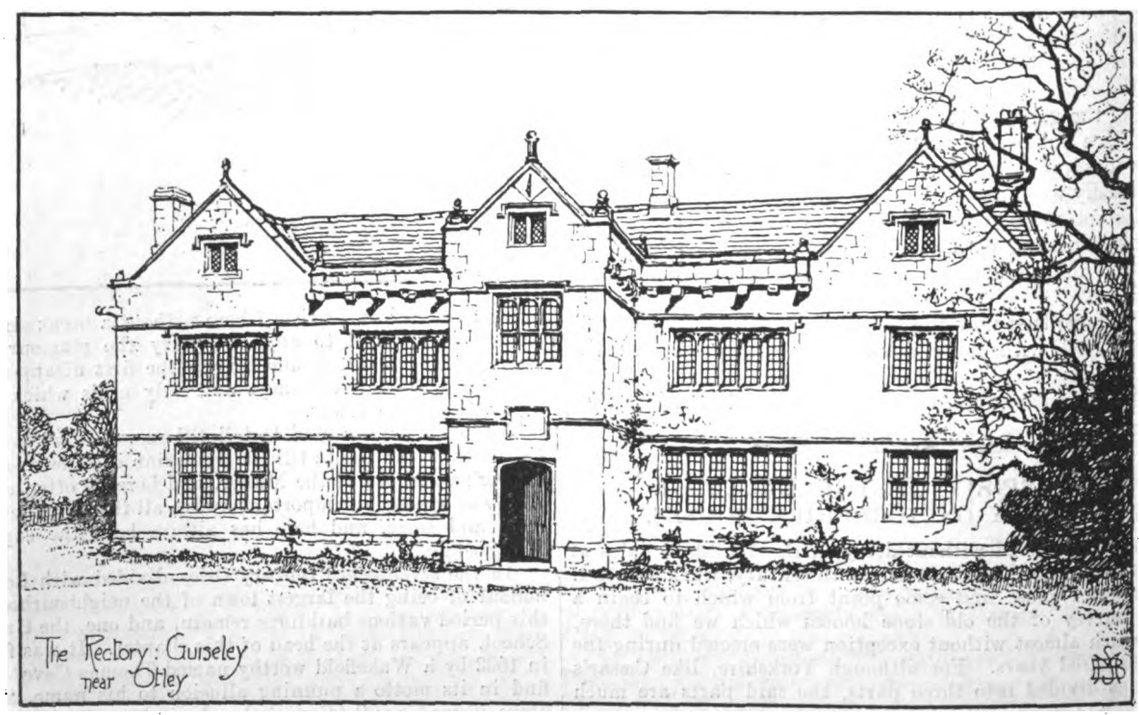


HEATH HALL
CHAMBER FLOOR AS BUILT

eerie tale about it. Its very situation is mysterious, for until the reservoir was constructed in the valley below, no road led to it. The stone for its building must have been brought up on the backs of pack-horses—perhaps past the door of the house now engulfed in the reservoir where uncanny Edward Fairfax was writing a history of witch-

of the victims and brought away such a quantity of gold that he loaded a waggon with it and required a team of horses to bring him home. But "murder will out," and he returned to a land of closed doors and scowling faces. He washed his gold in a beck by his home, and with it he built Swinsty Hall. Fortunately modern antiquaries discredit this un-

pleasant fable and tell us that the low range of buildings adjoining and forming part of the Hall were in existence in 1575. They also refer us to a marriage settlement of that year wherein the son of the house—"the said Ffraunces, shall, by the grace of Almighty God, marry and take to wife Ellen Sotell, and her espouse after the laws of the Holy

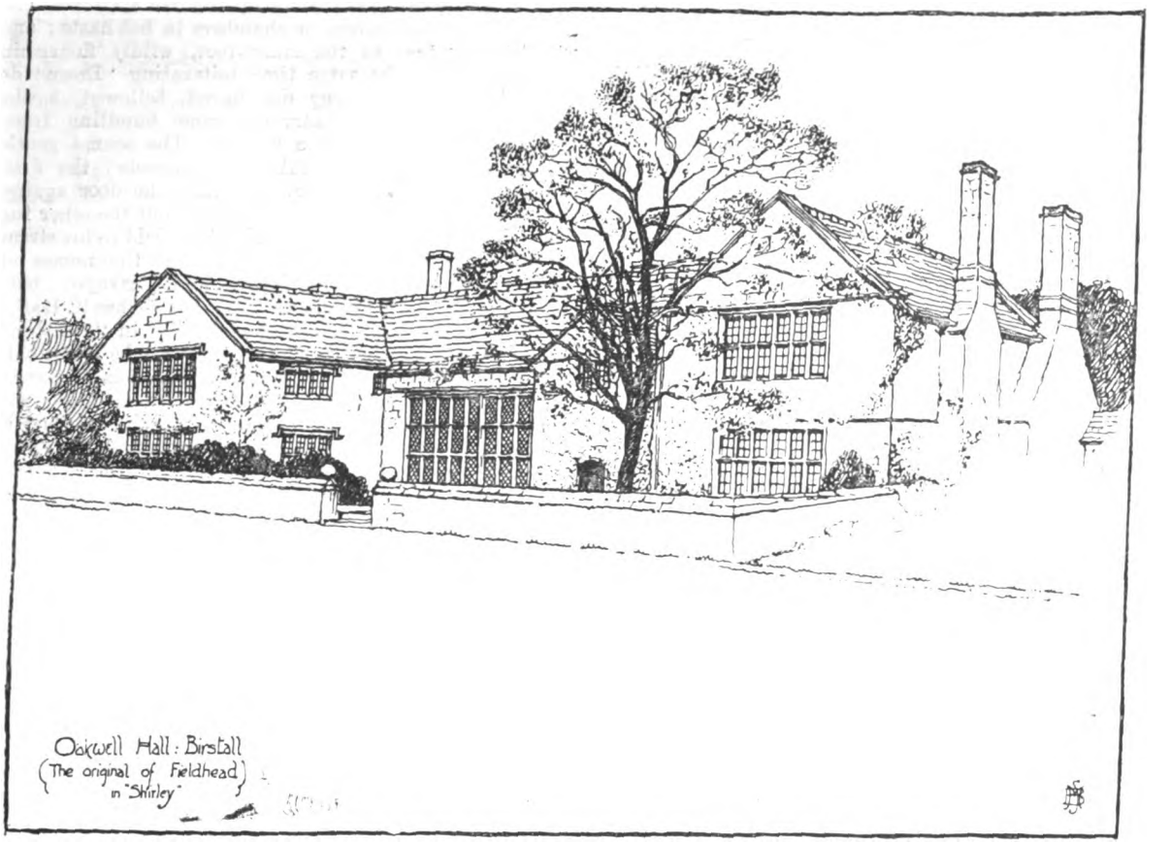


craft and demonology, for all his children were bewitched. Swinsty itself was built under the shadow of a curse. A poor weaver named Robinson, it is said, lived in a cottage close by, and went to London to seek his fortune. A plague was raging there, and he rashly visited the deserted houses

Church, at or before the feast of Phillip and James, Apostles, next ensuing after the date hereof. And the said Ellen will thereunto condycende and agree." Then after some talk of a matter of "one hundred marks of good and lawful English money," we find the bridegroom's father covenanting to

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"build a convenient house at Swinsty Hall for the said Ffraunces and Ellen" at his own "proper costs and charges. And if the said house be not builded within a year after the said marriage had and solemnised between the said Ffraunces and Ellen, as aforesaid, that then the said Henry



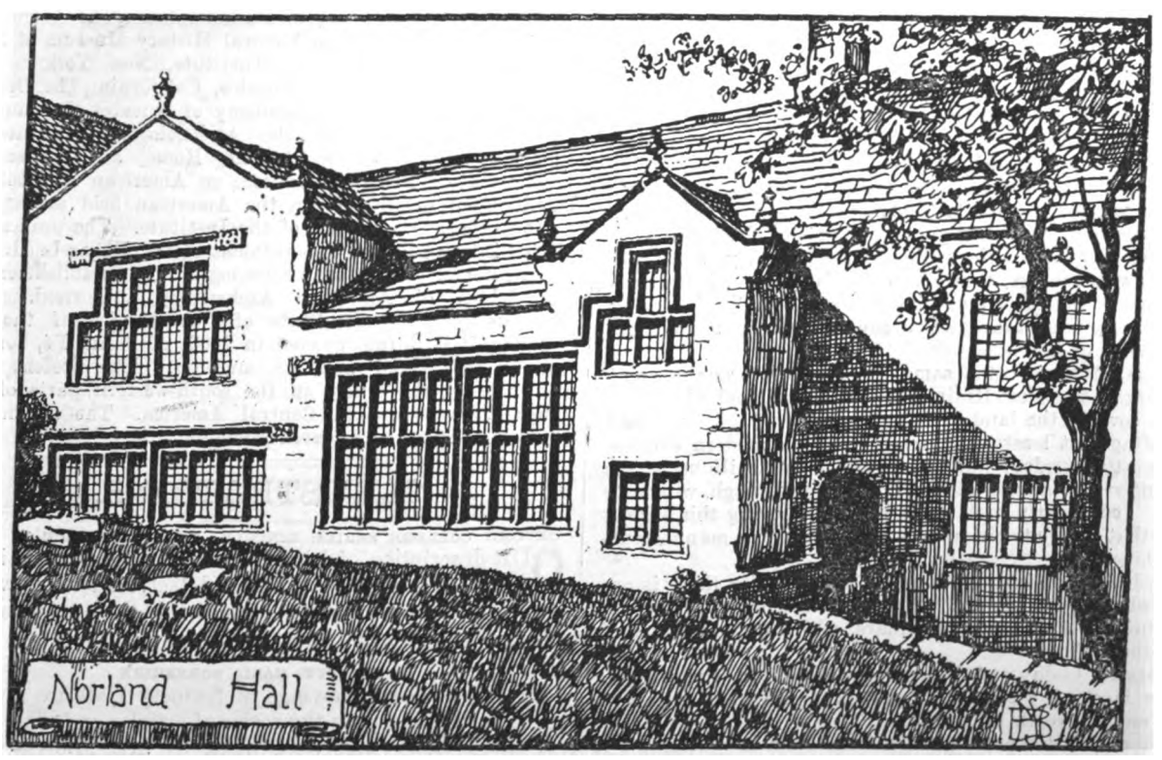
to give to the said Ffraunces and Ellen their boarder until the said house be builded and finished. And the said house shall be builded at the discretion of the said Henry"!

However, "condescending Ellen" must have had some trouble with her housekeeping bills, for only fifteen years later

porch was intended to form the centre-piece of a long front, with a wider projecting wing at each end.

The older buildings, that is, those erected prior to 1575, would probably have been demolished to allow of this scheme being carried out. This "E" plan, fancifully attributed by some to the initial of the Queen's name, was a favourite one with Elizabethan builders.

Here we may see all the characteristic exterior features of the old stone houses of Yorkshire—the rough yet massive masonry with large stones as quoins at the angles; the low-



we find that one Robinson bought the Hall for 2,000*l.* from the Woods. He it was who may have brought the plague-stricken gold from London. I have made measured drawings of the whole of this building, published as separate plates with this article, and am inclined to think that the projecting

pitched roofs covered with stone slates as large and as heavy as flagstones; an immense range of windows, sub-divided into many lights and again into small lead-glazed panes, except where these have been removed; quaint finials standing on projecting corbels, fine chimneys, a wide porch orna-

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mented with carved roses. You might search England through and you would find no house like this.

The section shows the construction of the fine oak roof, for in all these houses oak was exclusively employed. The timbers remain to this day in perfect condition, and are gracefully moulded and shaped. In the hall the great stone arch of the original fireplace remains. From here also a little flight of steps leads up on to a small gallery, from which one enters a fine panelled room.

The workmanship and design of this gallery is so beautiful and so characteristic of much of the interior work of such houses that I have included a detail showing a portion of it. And although this paper may seem to be chiefly concerned with the externals of the old Yorkshire halls, with their surroundings, and with the manner in which they were built, it must not be forgotten that all of them contain handsome woodwork at least as interesting as the masonry outside.

Another fine house near Otley is the old rectory at Guiseley, which has recently been restored. Many of the window-heads here are curved. The fenestration is interesting, not being absolutely symmetrical, and it may be remarked that the width of the window is usually reduced at each storey by lessening the number of lights. The central gable of this house is surmounted by a very unusual type of sundial.

A little lower down the Wharfe Valley, nearly opposite Farnley Hall, stands Caley Hall, which differs in many respects from the buildings we have already considered. The chimneys are placed here on the apex of the gables, the finials are less striking in design, and one of the bay windows has its two central lights forming a triangle on plan, a feature seldom found among these Yorkshire stone houses. A few miles further down the valley lies another old homestead of great historic interest, the Nunnery Farm, at Arthington.

So far back as 1152, the date when the Kirkstall monks began building their great abbey just over the wooded hills, the nunnery at Arthington was founded by the Cluniac nuns, an order which had first entered Sussex seventy years before; and besides being assisted by many of the leading families hereabouts, received the powerful patronage of the same great lady at Skipton who was instrumental in the founding of Bolton Priory higher up the dale. Yet all trace of this ancient house of St. Mary of Arthington has disappeared, and a few fragments of scattered stonework in the farm-buildings do not form any certain proof that it lay on exactly the same site.

To an architect its most noteworthy feature is the simplicity of its straight façade and the amazing number of its windows. In this respect it certainly bears the palm among the Yorkshire houses I have seen. It is a thoroughly architectural design in its excellent proportions, and notice should be taken that the windows are on the ground floor six panes high, on the next five, and in the attic four. It differs from the majority of examples by the vertical lines of its mullions running up in every case.

From the rural peace of the district surrounding Otley, we will now cross the hill to the smoky hamlets of Airedale, one of the busiest and most populous parts of Yorkshire.

It was high up in the valley above Keighley, amid the gaunt Haworth moors, that Charlotte Brontë and her sisters beheld one of the grim tragedies of their day, the incoming of machinery and the distress caused thereby among the poor weavers of the dales.

It was, however, this same cause which brought great prosperity to the West Riding in a few years, and which has since so covered the land with ugly chimneys and mills and with cottages at least as depressing, that a modern pilgrim to Haworth wonders how any genius could illumine the apparently sordid and utilitarian towns through which he passes. It is partly with the object of removing this stigma of soot that I wish to risk a visit to the Airedale manufacturing villages.

But before we turn to Keighley and Bingley there is one house which no reader of "Shirley" can ever forget—the beautiful old home of the Keeldars, which Charlotte named "Fieldhead."

It stands to-day as I have represented it in this drawing and as it stood when "the abundant shower of curates" fell "on the North of England."

"It was dark; not a candle shone from any window; it was absolutely still: the rain running from the eaves, and the rather wild but very low whistle of the wind round the chimneys and through the boughs were the sole sounds in its neighbourhood."

If we enter the ivy-clad porch and step into the hall, galleried and panelled, lofty and ancient, we admire our surroundings for a time, and then, as we notice the dog-gate at the foot of the fine staircase, our thoughts immediately turn to a famous episode in "Shirley," when the curates came to tea. There is no more bitter and ruthless exposure of an unmanly man than in Charlotte's description of Mr. Donne's flight from Shirley's great mastiff up these stairs:—

"A gentleman was fleeing up the oak staircase, making for refuge in the gallery or chambers in hot haste; another was backing fast to the stair foot, wildly flourishing a knotty stick, at the same time reiterating 'Down! down! down!' while the tawny dog bayed, bellowed, howled at him, and a group of servants came bundling from the kitchen. The dog made a spring. The second gentleman turned tail and rushed after his comrade; the first was already safe in a bedroom. He held the door against his fellow—nothing so merciless as terror; but the other fugitive struggled hard. The door was about to yield to his strength."

It would be no kindness to reveal the names of the originals from whom these curates were portrayed; but there is no harm done in telling you that Oakwell Hall, near Birstall, is the original of "Fieldhead" in "Shirley."

All round Keighley and Bingley are to be found old stone houses of the seventeenth century. There is Norland Hall, for instance, a very typical Yorkshire building with its numerous windows, quaint finials, and low-pitched gables. There is Riddlesden Hall, bare and gaunt, by the water-side, a very fitting site for such a theme as "Wuthering Heights," standing all alone in its grimness, lacking the softness and richness of Sussex farms and oasthouses. This grimness, we are told by some, is typical of the dalesman himself, strong and hard—"an austere man," with yet a touch of something quaint about him.

(*To be concluded.*)

ARCHÆOLOGICAL ACTIVITIES IN THE UNITED STATES OF AMERICA.*

THE paper opened with a brief account of the foundation of the Peabody Museum of American Archæology and Ethnology, Harvard University, the first institution in America founded for anthropological study, and recited its activities during the current year.

A short account followed of the Government's movements which finally led to the establishment of the Bureau of American Ethnology, its scope, and its work in the past and at the present time.

The establishment of the Field Museum, Chicago. The extensive and valuable contribution of the University of California. The Columbia University of New York. The University of Pennsylvania, Philadelphia. The Anthropological Department of the Natural History Museum of New York City. The Brooklyn Institute, New York. The South-West Museum, Los Angeles, California. The Denver Museum, Colorado. The Academy of Sciences, Davenport, Iowa. The founding of the Archæological Institute of America; its schools at Athens, Rome, and Jerusalem. The formation of the Committee on American Archæology. Development of interest in the American field among the various affiliated societies of the Institute. The unification of this interest by the appointment of Dr. Edgar L. Hewett as director of American Archæology. The establishment of the School of American Archæology authorised. The generous offer of the State of New Mexico of the old "Palace" building, erected in 1608, at Santa Fé, for the use of the school and its museum. The present field activities of the school in the south-western parts of the United States and in Central America. The advantages the school offers to research students.

ILLUSTRATIONS.

OXFORD COLLEGE SERIES, LINCOLN.—HALL—FIREPLACE IN HALL.

OUR description of Lincoln College has appeared in the last two issues of *The Architect*, and we now continue the series of illustrations of this College, which we shall complete next week.

SWINSTY HALL, YORKSHIRE.

THE measured drawings of Swinsty Hall are given in connection with the series of articles on "The Spirit of the Dales," and were made by Mr. MARTIN SHAW BRIGGS, A.R.I.B.A. Swinsty Hall, though not on the official programme, was visited by some of the members of the Architectural Association Excursion of this year.

* Abstract of a paper presented to the British Association at Sheffield, 1910, by Alice C. Fletcher.

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UNIVERSITY OF CALIFORNIA

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OXFORD COLLEGE SERIES. No. 83.—LINCOLN: HALL.

Photo by A. E. WALHAM, 60 Doughty Street, W.C.

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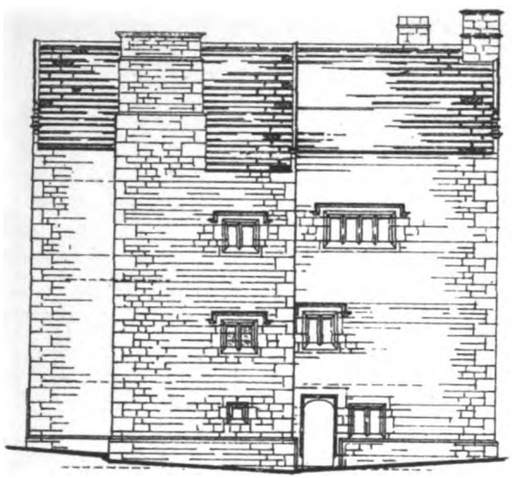


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MEASURED DRAWINGS OF SWINSTY HALL NEAR OTLEY

SCALE 0 5 0 10 20 30 Feet

BY MR. MARTIN SHAW BRIGGS A.R.I.B.A.



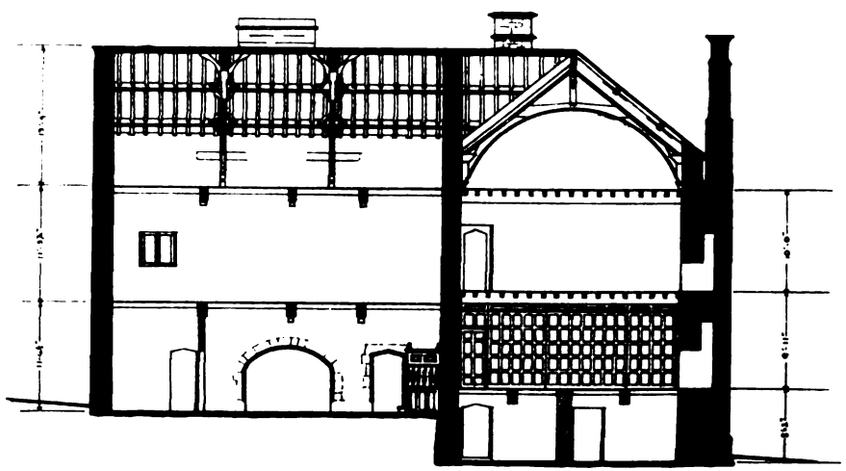
EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION



LONGITUDINAL SECTION

PHOTO LITHO. BERNARD & Co. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

The Architect, Sept. 16th 1910.

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MEASURED DRAWINGS OF SWINSTY HALL:

SCALE FOR DETAILS

SCALE FOR MOULDINGS

INCHES 12 6 0 1 2 FEET

BY MR. MARTIN SHAW BRIGGS A.R.I.B.A.

II: DETAILS OF STONEWORK

1. SECTION OF DRIPSTONE

2. SECTION OF HEAD (OR JAMB)

3. TRANSOM (OR MULLION)

4. SILL

WINDOWS OVER PORCH

5. PLAN OF JAMB.

WINDOWS IN HALL

6. MULLION

7. LARGE MULLION

8. FINIAL ON GABLE

9. CORNICE OVER PORCH

10. ROSETTE ON SOFFIT, OF ARCH

11. ARCH MOULDINGS IN PORCH

12. PRINCIPAL.

13 CURVED PIECE

14. CURVED BRACE

12-20: DETAILS OF WOODWORK

15. CAPPING OF BALUSTRADE

16 SECTION OF PANELLING AT AB

17. SECTION OF PANELLING AT CD

18. CORNICE ON OAK-ROOM DOOR

SCALE FOR Nos 15-18

19. PART OF PANELLING IN OAK-ROOM

20 PART OF BALUSTRADE IN HALL

PHOTO-LITHO SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

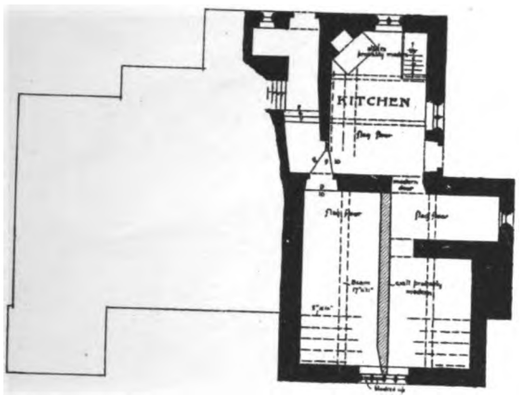
The Architect, Sept. 16th 1910.

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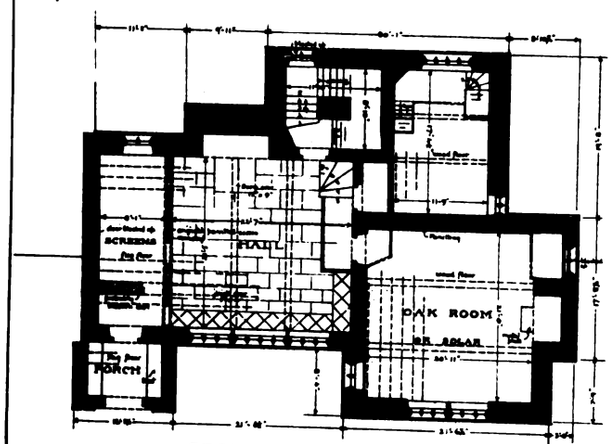
MEASURED DRAWINGS OF SWINSTY HALL NEAR OTLEY

SCALE

BY MR MARTIN SHAW BRIGGS A.R.I.B.A

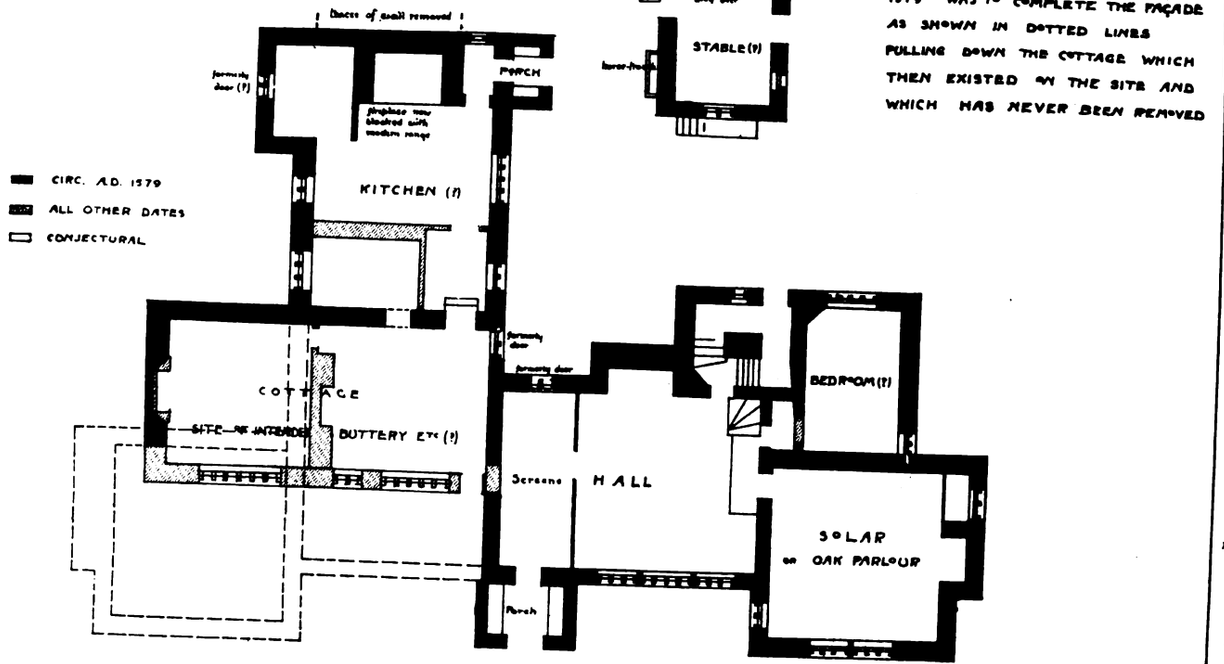


BASEMENT PLAN

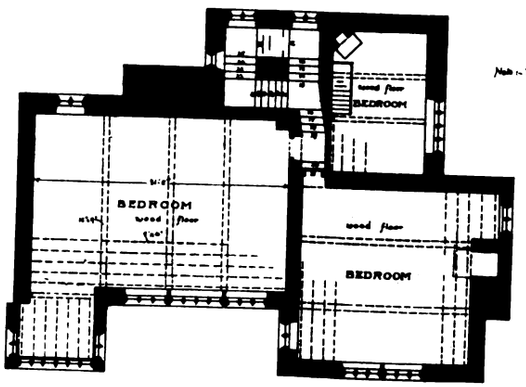


GROUND FLOOR PLAN

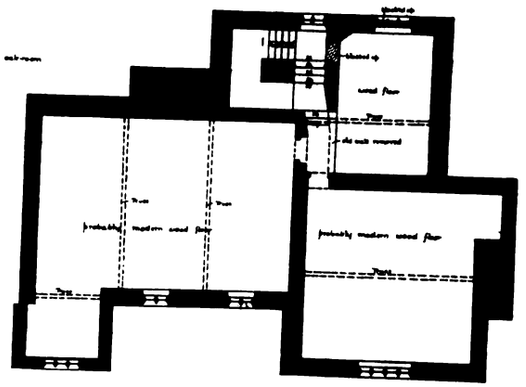
SKETCH PLAN OF SWINSTY HALL, BUILT A.D 1579, WITH ADJOINING BUILDINGS, &c.



NOTE :– IT SEEMS PROBABLE THAT THE INTENTION OF THE BUILDERS IN 1579 WAS TO COMPLETE THE FAÇADE AS SHOWN IN DOTTED LINES PULLING DOWN THE COTTAGE WHICH THEN EXISTED ON THE SITE AND WHICH HAS NEVER BEEN REMOVED



FIRST FLOOR PLAN



ATTIC PLAN

PHOTO-LITHO SPRAGUE & Cº LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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MEASURED DRAWINGS OF SWINSTY HALL NEAR OTLEY

SCALE 0 1 2 3 4 5 10 FEET

BY MR. MARTIN SHAW BRIGGS · A.R.I.B.A.

DETAILS OF ROOF OVER OAK-ROOM WING

DETAILS OF PORCH AND GABLE OVER

PHOTO-LITHO BRAGUE & Co. Ltd. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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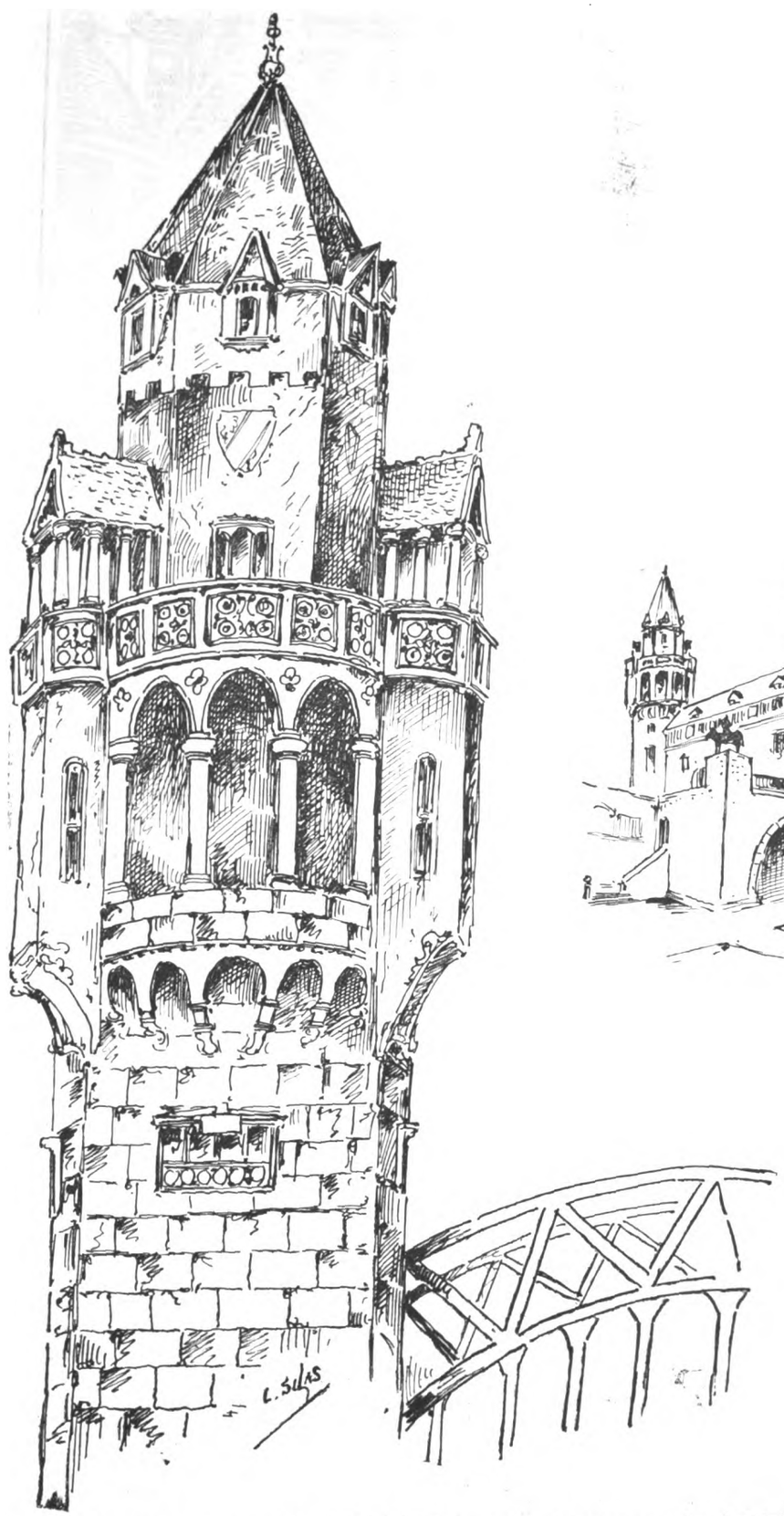
OXFORD COLLEGE SERIES. NO. 84.—LINCOLN: FIREPLACE IN HALL.

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NOTES FROM COLOGNE.

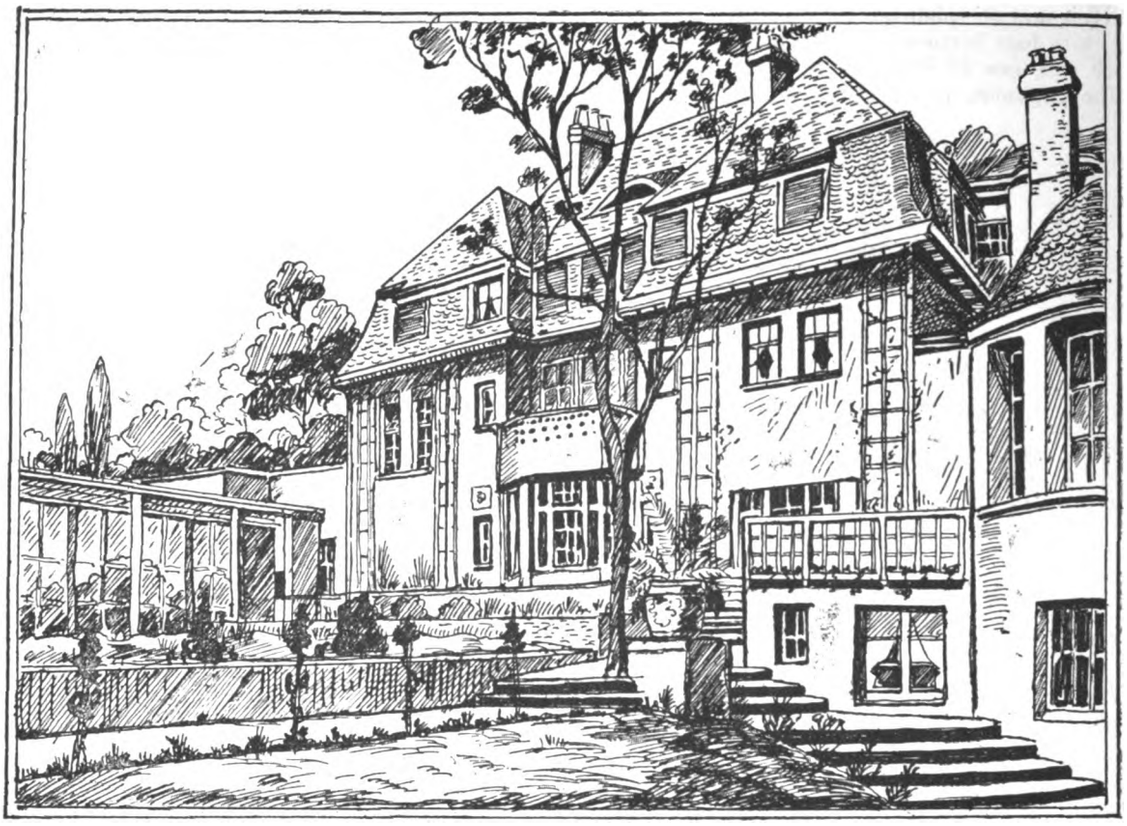
COLOGNE is now completing a large bridge across the Rhine, with four statues of the German Emperors, two at each end, one of which is that of the present Kaiser. The entrances to this large bridge are built of solid stone with towers surmounted at the top by slated roofs, reminiscent of the old castles seen in Germany. The treatment of these bridge towers is shown in the accompanying sketch.





The villa in " Parkenstrasse " is the residence of one of the principal architects of Germany, designed for himself by Herr CARL MORITZ, who designed the Grand Opera House and other of the most important modern buildings in Cologne. The view shown of his house is taken at the back from the old-world fashioned garden, with its terraces, its fountain, and its flowers. Herr MORITZ is a professor of the " new-art " or " new-bau " school of architectural design, but as he explains it is not completely new, being largely tinctured by the feeling of old German architecture.

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HOUSE OF HERR MORITZ IN THE PARKENSTRASSE, COLOGNE.

SOME UNEXPLORED FIELDS IN BRITISH ARCHÆOLOGY.*

THE purpose of this paper was threefold, viz.:—1. To indicate some hitherto unexplored fields of research where antiquities await the spade of the field-archæologist; 2. To draw attention to the wholesale destruction of antiquities now going on in different parts of the kingdom; and 3. To suggest the establishment of regular and systematic oversight of great engineering works which involve excavation and removal of the soil.

The value of the spade in archæological investigations was never more appreciated than it is to-day; yet, in spite of activity in various directions, many fields of research remain either entirely unoccupied or only partially worked. Whilst Roman sites are being explored in considerable numbers in England, Wales, and Scotland, the remains of pre-Roman times are, with one or two exceptions, comparatively neglected. It is remarkable that so little attention is given to the sites of prehistoric huts and other dwellings. A hint of what may be expected by further excavation of these sites is afforded by the recent accidental discovery of gold torcs of the Bronze Age under the floors of ancient hut dwellings at Bexley, Kent.

The sites of ancient dwellings exist in large numbers in many parts of the country. They may be traced in much of the uncultivated land in England, as well as the mountainous districts of Wales. In certain districts in Wales dwelling-sites are particularly abundant, and in some cases in close proximity to bogs, a circumstance which suggests the advisability of draining the bogs with a view of recovering the antiquities which almost certainly are buried therein.

Other unoccupied archæological fields are blown-sands, dry river-beds, the dry sites resulting from shrunken and diverted rivers and drained marshes. In these various deposits the antiquities are in comparative safety, although in many districts scientific investigation, on the lines of the excellent work at Glastonbury, is most desirable.

The wholesale destruction of antiquities now going on as a result of coast-erosion, railway and other great engineering works, is a most serious matter. There is pressing need for supervision of all these great works, in order that the antiquities may be rescued and the circumstances of their discovery placed on permanent record.

The writer advocated the immediate establishment, as far as possible, of a regular system of archæological oversight wherever and whenever excavations are being made in the soil; and he suggested that the matter be brought to the notice of the Government in order to enlist its sympathy and support.

* Abstract of a paper presented to the British Association at Sheffield, 1910, by Mr. George Clinch.

MODERN COLD STORAGE AND REFRIGERATION.

By W. S. DOUGLAS, B.Sc.

XVIII.—REFRIGERATION IN THE RETAIL MEAT TRADE (*continued*).

MANY very large freezing machines have been put down for wholesale meat men, but by far the commonest type of plant one meets with is the small machine and cold store used by the ordinary retail butcher. In most cases the meat handled is home-killed, being either bought at market in the case of town trade, or slaughtered by the butcher himself, if his business lies in the country. Consequently the storage temperature is usually from 35° to 38° Fahr., and a system of air-circulation must be adopted to remove the non-condensable vapours.

A typical small plant of this class is illustrated in fig. 54. The installation was erected for a butcher in a country town, who does his own killing, and wished to have a better control of his buying market. This object he has attained perfectly by means of the plant, which enables him to buy one or two beasts or several sheep, when he can do so advantageously, kill them, and store the carcases until such time as they are required in his business. At the same time he keeps most of his small stuff in the store, if the weather is at all warm, and also deposits there his surplus stock at the week-end.

The cold room measures internally 6 feet by 13 feet 6 inches by 7 feet, giving an inside capacity of 567 cubic feet, and to maintain it at the correct temperature a small machine on the sulphur dioxide principle by Messrs. Wm. Douglas & Sons, Ltd., was installed, having a capacity of 1.16 tons refrigeration or 15,400 B.T.U.'s per hour. It is of the vertical type, the compressor being bolted to the side of the cast iron condenser tank. A submerged condenser is formed by circular coils of W.I. lapwelded tubing inside the tank, and water, being admitted at the bottom and taken off at the top, flows upwards over the coils. Driving power is furnished by a 3 h.p. vertical gas engine, which also drives the air-circulating fan through a counter shaft,

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and a meat-cutting machine, which, together with the horizontal filler, forms the butcher's outfit for the manufacture of sausages, is seen to the right.

The machine is connected up to an air cooler, which is located inside the cold room, but kept separate from it by a wooden partition. A hole at the top of this partition of the same diameter as the fan serves as admission port for the heated air rising from the meat, and through it the air is sucked in by the fan and impelled downwards over the air-cooling coils. Two other holes, one at each bottom corner of the partition, are left for the air, cooled by contact with the coils, to escape again into the bottom of the cold room, and one of these is extended by means of a length of wooden trunking, in order to ensure proper distribution.

The air cooler itself consists of a flat coil of lap-welded tubing in which takes place direct expansion of the refrigerant. One end of the coil, as explained in a former article, is connected up to the expansion valve over the condenser, and the other direct to the suction of the compressor. Hence the liquid, spurting through the expansion valve, evaporates in the coils, and is again sucked back to the compressor, after taking its latent heat from the air passing through the cooler.

To provide storage of "cold" and prevent too rapid a rise of temperature during the night, the coils are partially immersed in a tank containing calcium chloride brine. With the same end in view the insulation has been designed with a view to high efficiency, and consists of first a layer of 1-inch T.G. & V. matching on the outside, next 6 inches of silicate cotton packed between 6- inch by 2-inch battens at 24-inch centres, and finally on the inside two layers of ¾-inch T.G. & V. matching, with waterproof insulating paper between. On the floor the two layers of ¾-inch matching are replaced by 1¼-inch T. & G. flooring, the waterproof paper being laid underneath.

Rails, it will be noticed, have been provided on the ceiling for hanging meat, and one of these is carried just outside the entrance door.

This particular plant has been selected for description, because it is of a type of which many hundreds will be found in this country, and provides a very good example of ordinary practice in this application of the freezing machine. At the same time it is natural that slight differences should be observed in individual cases. Sometimes, for instance, the meat handled is Colonial, and the room must then be maintained at 24° Fahr. instead of 35° Fahr. In such a case direct expansion pipes round the sides and ceiling instead of a direct expansion air cooler, are not infrequently employed. In other businesses where both foreign and home-killed meat is dealt with, two separate stores are built, as illustrated in the last article, each being maintained at its correct temperature. The motive power too is various, but is usually found in the form either of a gas engine or of an electric motor, although oil engines, steam engines, and even water motors are occasionally used.

The general design, however, remains the same, and our illustration may be taken as sufficiently typical to render a further investigation of this type of plant unnecessary.

As regards the specifications in a case of this sort, the lines already laid down for the larger plants can be followed without much alteration. The insulation would be the same, also most of the other clauses, and the duty of the machine would be stated in a similar way, except that in the small plants there is only one cold room, and that consequently all that is required is the total weight of meat which must be cooled in the course of the daily run. The storage temperature for ordinary home-killed meat would be 35° Fahr., and for frozen mutton, &c., about 24° Fahr.

Bearing these points in mind, and remembering the guarantee formula, &c., given in Article XV., no difficulty should be experienced in drawing up a binding specification for the refrigerating machinery and cold room. All that is left then is the motive power, with which subject we propose to deal later on as a whole. In the meantime, it may be said that the best plan in small plants is simply to specify a gas engine or electric motor, as the case may be, of sufficient power to drive the compressor, under all circumstances. The determination of the actual power taken can then be left to the manufacturers, all that they require to calculate this being the maximum and usual temperature of the cooling water which is led to the condenser. They should also be given, in the case of the motor, full particulars of the electric supply and should be asked to state, for the purposes of reference, what horse-power they propose to instal.

The cost of these plants naturally varies a little with circumstances. About the smallest size of cold store which it is at present economical to cool mechanically is a room having a inside capacity of 250 cubic feet. This would hold about 15 cwts. of meat, and if not more than 10 cwts. were put in daily a freezing machine with a capacity of 0.45 tons refrigeration per twenty-four hours would be sufficient to maintain it in summer at 35° Fahr. This allows for a daily run of eight hours.

The cost of such a plant would be roughly as follows:—

Compressor, condenser, air cooler and fan erected on site	£110	0	0
Cold room insulated with six inches of silicate cotton	33	0	0
	£143	0	0

A gas engine (2 B.H.P.) to drive this machine would cost about 30*l.* and an electric motor about 20*l.*

With larger plants the cost is less in proportion, and for a room of 3,000 cubic feet (20 feet by 20 feet by 7 feet 6 inches) the figures would be approximately as follows:—

Compressor as above	£300
Cold room	120
	£420

A gas engine to drive this plant would cost about 70*l.*, and a motor about 40*l.* On the average the room would hold some 10 tons of meat, and 4 tons could be put into it daily without exceeding the eight hours' run.

ABATTOIRS.

As its name implies, an abattoir is a place devoted to the slaughtering of animals, and although any slaughtering house might, in a strict sense be termed an abattoir, the name is reserved as a general rule for the large public concerns which are run by various municipalities.

These replace the private slaughtering houses which every butcher in the old days had to possess, and there is no question but that the change is for the good of the meat trade in general, and that any movement towards it should be encouraged in every possible way. Not only is the treatment of the animals more humane, but also the conditions attending the production of the people's food are rendered far more hygienic. In addition a better market is obtained for the various by-products, produced as they are in marketable quantities, and it is possible at the same time to ensure by stringent inspection that no meat unfit for consumption shall be put upon the market. Instead it is profitably dealt with by special apparatus, which could not be employed were the quantities available too small.

Another advantage, which more concerns us here, is that while in private concerns the expense of putting in cold storage plant is frequently prohibitive, it forms in a modern abattoir a necessary part of the equipment. By its aid the meat is properly matured for consumption, and can be stored, should the market not be favourable for effecting a profitable sale.

Unfortunately, however, the state of the meat trade in England has not hitherto encouraged those who are in favour of the public abattoir. In Germany, on the contrary, it is established in any large town by law. The reason for this is that less than two-thirds of our meat is produced in our own country. Consequently, in the face of foreign competition, prices are low, and there is little inducement to home products. To show this state of things in actual figures we reproduce the following statistics:—

	1904 per cent.	1909 per cent.
Home produced meat	65.2	63.5
Imports of live or newly killed	12.1	6.6
Chilled meat imports	8.3	7.6
Frozen meat imports	14.4	22.3

It is apparent from this table that although the imports of live and chilled meat have diminished, frozen meat imports have increased to such an extent that the percentage of home-killed meat is actually reduced. The tendency, too, is all in the direction of a yet further reduction, so that the outlook for public abattoirs is not so promising as it might be. At present the total number in the country is only 52.

This is why it is that German abattoirs make a more interesting study than our own. There, of course, practically all the meat consumed is home grown owing to the protective barrier. We shall accordingly, in dealing with this subject, draw largely upon German practice.

In choosing a site for an abattoir, care should be taken that it is well removed from all other buildings and that

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there is ample and free access by road and rail. It is also important that there should be good drainage facilities and an ample supply of good water, while no difficulty should be experienced in obtaining cheap coal for power purposes.

The usual plan in setting the place out is to arrange the various buildings to form as far as possible a natural sequence so that the animals can follow the shortest possible course from the entrance through the various departments to the exit. Often they are brought in by rail, and in that case they will start their career at the unloading platforms. Leaving these, they are driven into pens, where they remain till they have cooled down after the journey. From these pens narrow passages communicate with the slaughtering halls, and the animals, when ready, are taken through these, tied to the killing rings (in the case of "beasts" or large cattle) and either pole-axed or killed by some humane slaughtering appliance. Sheep, on the contrary, are usually killed in cradles.

The carcases are next hoisted up and attached to small carriages running on overhead trackways, where they are catching pen, and next to it a sticking pen. In the former the pigs are shackled by the hind legs and hoisted to the overhead track bar, and in the latter they are stuck while hanging head downwards. Afterwards they are transferred, passing the scalding tank and scuttling table, where the bristles are removed, to a set of overhead bars in the hanging house. There they hang till the animal heat is dissipated, and they are finally carried by an extension of the trackways to the chill room.

The sheep are killed in cradles and, being fairly light, are carried on the shoulders of the attendants to the cold room destined for them. For beasts, however, more elaborate arrangements are necessary. Coming from the lairage they are tied to the killing rings, pole-axed, and hoisted by means of a travelling crane to stiff, well-supported bars. A system of these fitted with a series of switches extends into an ample hanging house, and there the sides, into which the carcases are split, are allowed to hang till they cool down. When that is accomplished they can be either taken straight away to the vans or deposited in the chill room, according to the

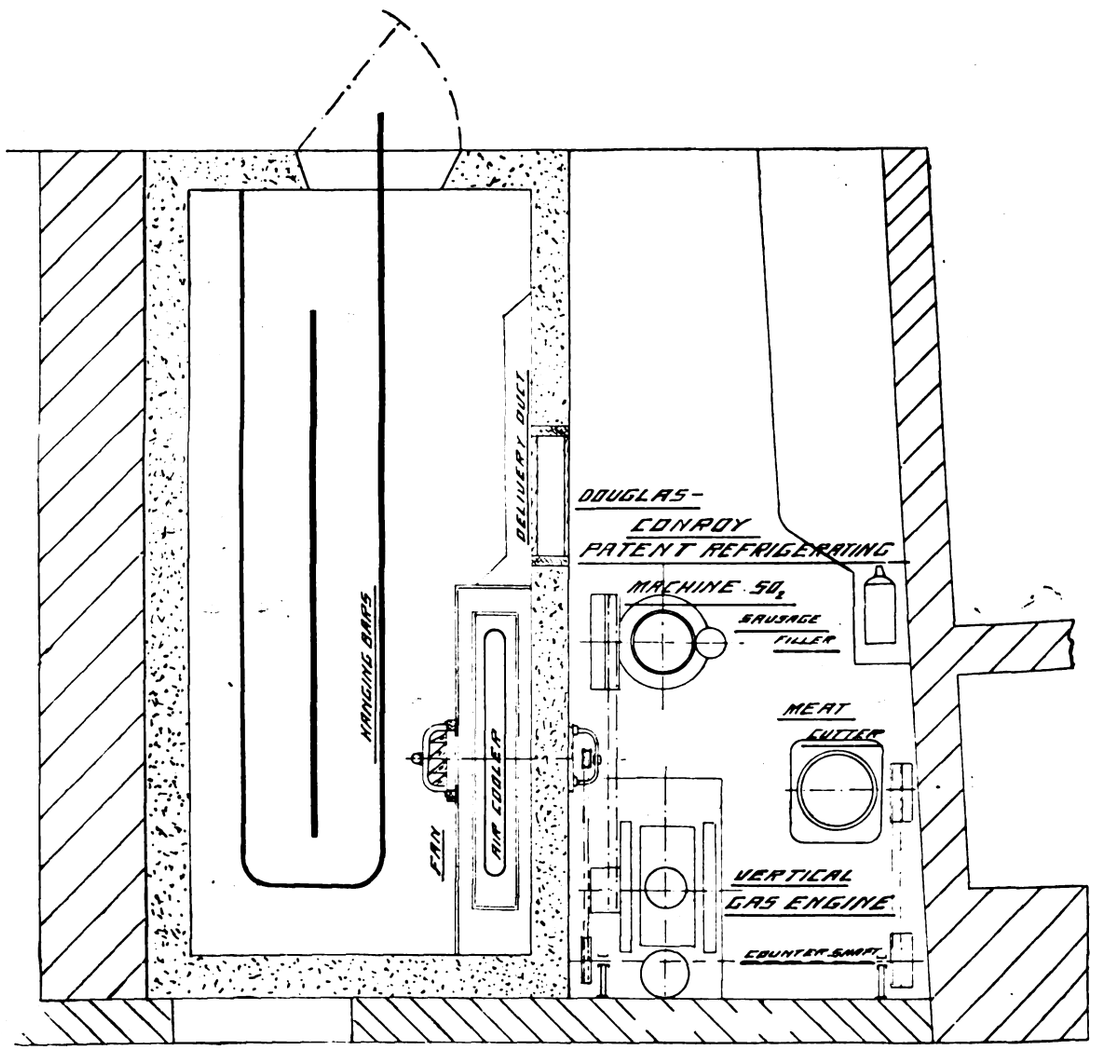


FIG. 54.—BUTCHER'S COLD STORAGE PLANT.

split, if large, then skinned, cleaned and dressed. Afterwards they are transported by means of the runways to hanging houses, in which ample facilities are provided for continuous ventilation by means of air currents, these being sometimes cooled by the freezing machine. Then, when the animal heat has been dissipated as far as possible in this way, the carcases are finally deposited in the chill room to mature and await despatch.

The nature of the plant necessary for the proper carrying out of these operations is illustrated in fig. 55, which shows a small abattoir erected at Stockton-on-Tees. It is designed to deal with about 120 beasts, 350 sheep, and 120 pigs per week as a maximum capacity.

Referring to the figure, the sheep and pig pens, together with the cattle lairage, will be noticed at the right hand side near the entry. Next to these come the killing tackle for the various classes of animals. For the pigs there is a

requirements of the day. For each of these alternatives suitable extensions of the tracking have been provided.

Rolled-steel joists, shown in dotted lines, have been arranged to carry the trackways, and where the spans are too long six-inch cast-iron columns are added as supports. The joists in most cases are of 5 inches by 6 inches section, but those which carry the travelling crane are 6 inches by 12 inches.

The refrigerating plant is located in the left-hand corner. It consists of three chill rooms, for cattle, sheep, and pigs respectively, and the refrigerating machine which cools them, together with an electric motor to drive the compressor.

The first chill room, for cattle, has an inside capacity of 2,450 cubic feet, holding about 8 tons of beef. The second, holding 3.2 tons of mutton, has a capacity of 800 cubic feet; and the third, for pigs, 530 cubic feet. Air locks are provided for the two last named, and the insulation in all cases

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is composed of 6 inches silicate cotton, having two layers of matching on the inside, with a course of black paper between, and one layer of matching on the outside. One and a quarter inch tongued and grooved boards are used for the floors.

It is necessary that in all three rooms a perfectly equable temperature should be maintained, and that at the same time there should be free circulation of air, since in no case is the temperature below freezing. Accordingly, cooling is effected by means of galvanised brine drums on the ceilings of the rooms themselves, aided by circulation of air from a separate air cooler on top of the chambers, which is connected to them by suction and delivery trunks. The cooler is of the usual type, consisting of stacks of brine pipes arranged in an insulated chamber. Over these the air is impelled by a 24-inch fan, and the condensed moisture is removed by a suitable drain from the lead tray at the bottom.

Cold brine is supplied to the drums and to the cooler by a rotary pump, which is connected to the insulated evaporator, forming part of the refrigerating machine. Needless to say, all the connecting pipes conveying the brine are, when exposed to the atmosphere, carefully lagged to prevent leakage of heat.

The refrigerating machine itself is on the sulphur dioxide principle, and consists of the usual three units—compressor, condenser, and evaporator. All of these are located in the engine room immediately adjacent to the cooling chambers,

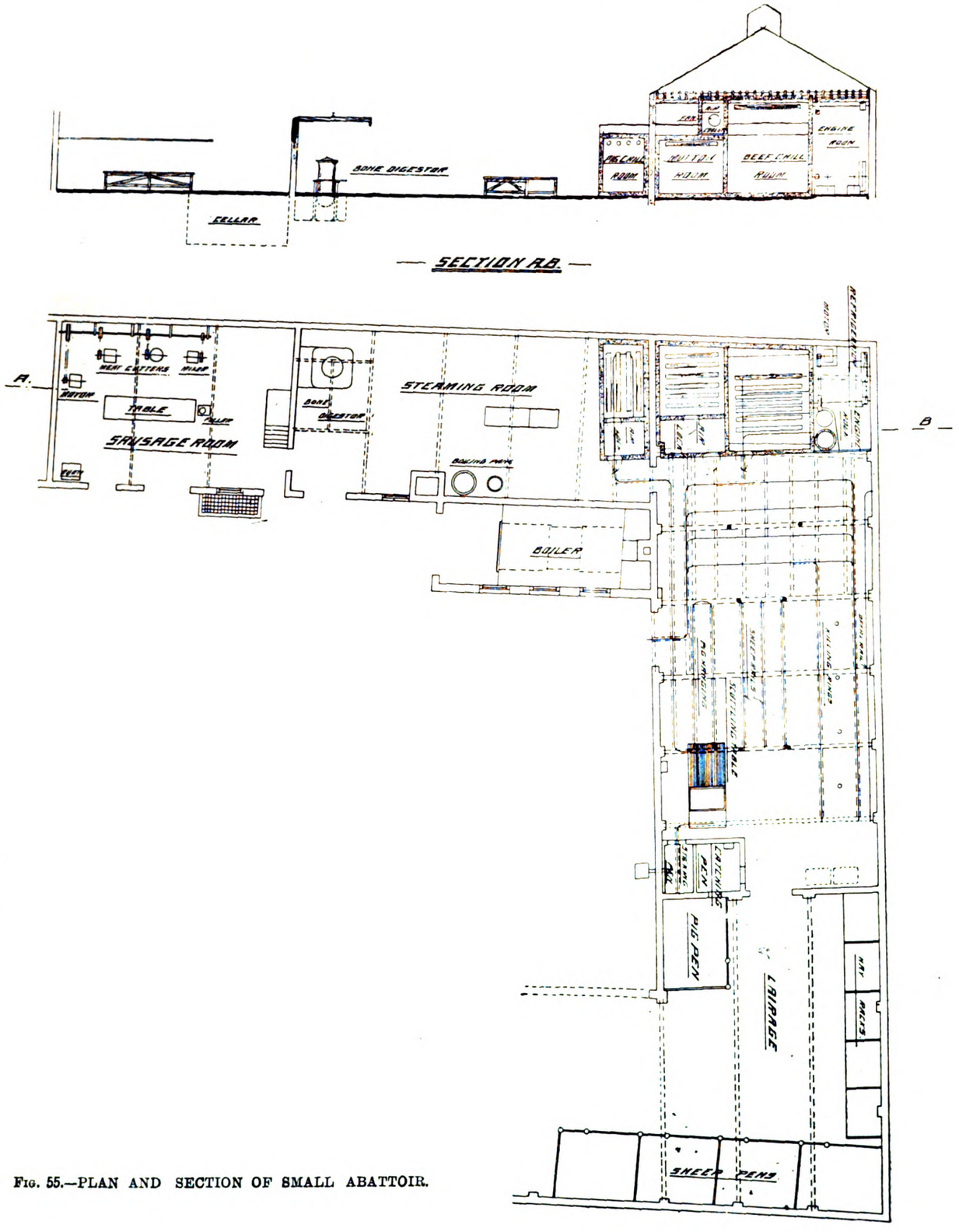
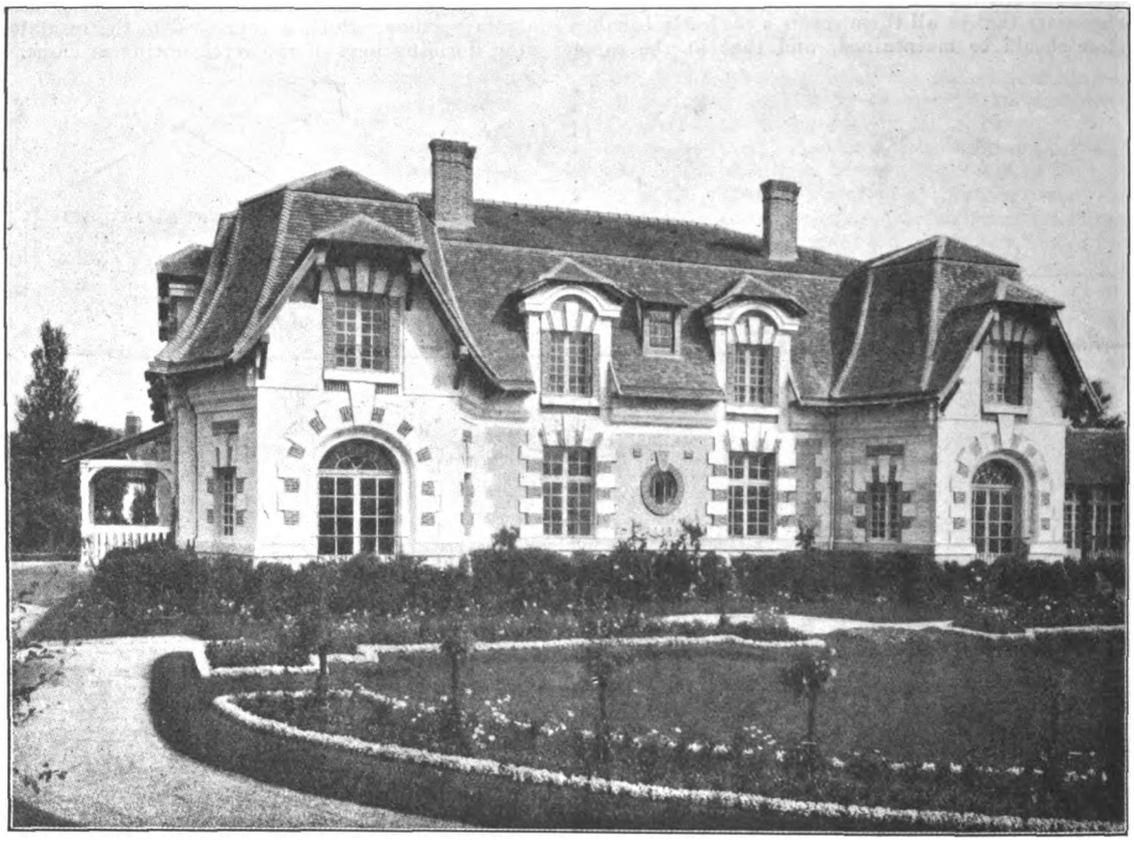


FIG. 55.—PLAN AND SECTION OF SMALL ABATTOIR.

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MODERN EUROPEAN ARCHITECTURE.
FRANCE.



[From *La Construction Moderne.*

MR. W. K. VANDERBILT'S VILLA AT SAINT LOUIS DE POISSY—PRINCIPAL FRONT.—M. HENRI GUILLAUME, Architect.

together with the 10 horse-power electric motor which drives the compressor. The last-named is of the horizontal pattern, and the power of the motor is transmitted to it through a countershaft, which reduces the speed to the requisite value.

In the opposite corner are the condenser and the evaporator. The former is of the submerged type and takes about 700 gallons of water per hour, while the evaporator, which is next to it, has rather more than this quantity of brine circulated through it from the cooling appliances. The capacity of the whole system, which was supplied by Messrs. Wm. Douglas & Sons, Ltd. (who also designed and equipped the abattoir), is some 6.8 tons refrigeration per twenty-four hours.

Beyond the cooling rooms are the various appliances for dealing with the bye-products. These include a digestor to extract the fat and gelatine from the bones, pans for rendering the pigs' fat into lard, and a complete sausage-making equipment driven by a 5 horse-power electric motor. There is also a boiler which, in addition to furnishing steam for plant in other buildings close by, serves the jacketed pans, scalding tank, and bone digestor in the abattoir.

(To be continued.)

THE EXCAVATIONS AT CAERWENT, MONMOUTHSHIRE.*

THE excavations of 1909 were at first carried on in the north-east corner of the city. Important additions were made to the plan, which was found to preserve the regular arrangement noticed elsewhere. Remains of several houses were discovered, and also those of a building more than once altered, which, it is possible, are those of a Christian church. Later in the season attention was devoted to the completion of the excavation of the central insula in the north half of the city, which contains the Forum and Basilica. The greater part of it had been excavated in 1907, but it was found possible in 1909 to make arrangements for the exploration of the western portion of the Basilica and the western side of the Forum. The block was found to be perfectly rectangular, being thus more carefully laid out than most of the other buildings at Caerwent. The Basilica had no apse at either end, but at each end of the north aisle and nave was a chamber of the same width as theirs, while at each end of the south aisle there was an entrance from the streets which ran outside the Forum on the east and west. The south aisle had an open arcade towards the Forum, which was surrounded on the other sides (with the possible exception of the west side) by an ambulatory and shops; and the open area was drained by a large box drain.

The excavations of 1910 were conducted on the south side of the high road, which coincides with the ancient road through the centre of the town. They resulted in the discovery of a few houses, one of them much altered, so that its original plan is difficult to make out. In the centre of it is a well-constructed cellar. Numerous skeletons have been discovered here, over a hundred in all. The burials are obviously of post-Roman date, the walls of the house having been partially destroyed when the graves were dug.

* Abstract of a paper presented to the British Association at Sheffield, 1910, by Mr. T. Ashby, M.A., D.Litt.

OUR CONTEMPORARIES FROM OVER-SEAS.

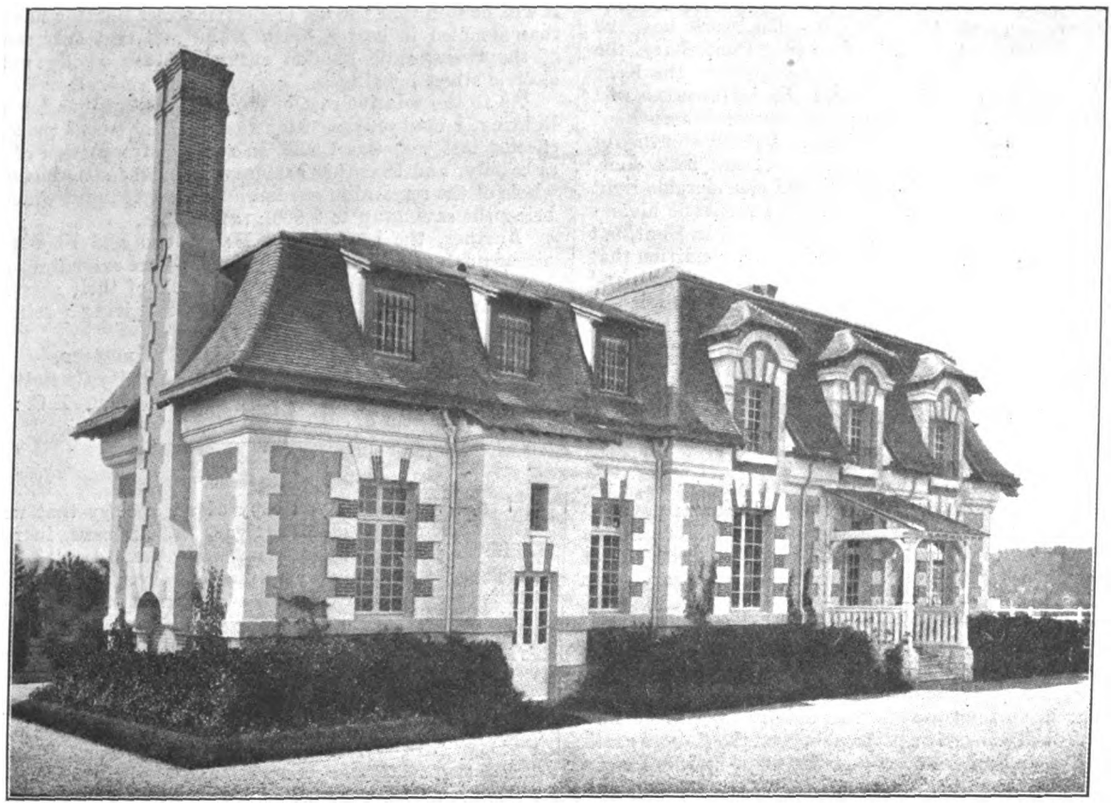
THE *American Architect* (New York) has a leading article by Mr. Frank Chouteau Brown on "The English-derived treatment of the small American dwelling," illustrated by sketches of examples by the author, and the principal illustrations are also devoted to houses of the same type by Messrs. Albert Kahn & Ernest Wilby and by Mr. Brown.

La Construction Moderne (Paris) illustrates another of the grand "restoration" designs exhibited by M. E. Hebrard in the Salon this year—the Plaza del Campo of Siena and its surroundings. Views are also given of a fine "new-art" sepulchral monument at Milan, of which Signor A. Melani is the architect.

Berliner Architekturwelt (Berlin) is this month a monograph of domestic work by Herr Hermann Muthesius, which is remarkable for the author's versatility and originality in the welding of "new-art" methods with traditional German feeling in composition.

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MODERN EUROPEAN ARCHITECTURE.
FRANCE.



[From *La Construction Moderne.*

MR. W. K. VANDERBILT'S VILLA AT SAINT LOUIS DE POISSY—ENTRANCE FRONT.—M. HENRI GUILLAUME, Architect.]

Arkitektur og Dekorativ Kunst (Christiania) illustrates a house in the Ths. Heftyes Gate, of which Mr. Hans Backer Fürst is the architect; and premiated designs for furniture by Mr. Carl Berner, submitted in a competition promoted by the Kristiania Haandverks-og Industrie-forenings.

The *Architectural Record* (New York) has a descriptive and fully illustrated article on the New York Public Library, "the most important of the great American educational institutions," and, to our mind, one of the best works of Messrs. Carrère & Hastings. "A Successful Boston Residence" is the title of an illustrated description of a house designed by Messrs. Parker, Thomas & Rice, noteworthy for its restraint and refinement. In the series of articles on the Architecture of American Colleges, the University of Pennsylvania now comes under review, with the colleges of Girard, Haverford, Lehigh and Bryn Mawr.

Zodtchy (St. Petersburg), in its series of articles on garden cities, now turns to Germany, and deals with Hellerau.

Engineering Record (New York) has an interesting paper on "The Behaviour of Hydraulic Compounds in Sea-water" by Herr H. Burchartz, of Gross-Lichterfelde. Another interesting article on a difficult subject is that by Mr. Louis F. Brayton on the "Computation of Reinforced Concrete Flat Slabs."

Correspondence.

[The Editor will not be responsible for the opinions expressed by Correspondents.]

The Town Planning Conference and Municipal and District Councils.

SIR,—Much of the actual work of preparing the Town-Planning schemes provided for under the new Act will fall within the scope, not of the great corporations but of the borough and urban district councils. It is, therefore, of the first importance that these authorities should avail themselves of the singular advantages offered by the Conference, which will be held in London from October 10 to 15, for the study not only of the history of the subject, but also of the examples which will be presented of the architectural methods adopted in other countries as well as in our own.

The Local Government Board will, I am informed, be prepared to sanction such reasonable expenditure out of the rates, subject to Government audit, as may be entailed by the attendance of representatives at this Conference, provided that not more than three members of an authority attend officially, one of whom should be the architect or surveyor.

The Royal Institute of British Architects has not hesitated to incur very heavy expenditure in the fulfilment of what it considers to be a public duty, by organising the Conference and bringing together the great collection of drawings and models which will be exhibited at the Royal Academy. It must necessarily be very long before the circumstances can recur which have rendered it possible to make the present arrangements, and the Royal Institute asks that all those who are responsible for the administration of the Town Planning Act of 1909 will support it in the effort which it is making for the public good, and send their applications for membership of the Conference to me without delay.—I am, Sir, yours truly,

JOHN W. SIMPSON, F.R.I.B.A.,
Secretary-General.

9 Conduit Street, Regent Street, London, W.:
September 14, 1910.

A Further Open Letter to Sir Aston Webb, C.B., R.A., F.S.A., F.R.I.B.A.

SIR,—The *nom-de-plume* of your correspondent ("Unlucky Competitor") on the subject of limitation of work in competitions indicates the germ of the controversy. It is to attain such limitation and prevent such unluckiness that I and others are so strenuously striving to reduce the number of "unlucky competitors" who lose heart and cash by repeated defeats—defeats that are needless and preventable. I see no special advocacy for the benefit of the older practitioners in limitation, nor do I see that the best man can fail in getting to the top; in fact, all that the proposals will do is to prevent waste of time and money and remunerate those who have a ghost of a chance.—Yours, &c.,

L.

P.S.—Since writing the above I have had the pleasure of reading "Treadmill's" able letter in your current issue, and note he is "almost persuaded" to join the L.M.-ites.

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An Old Abbey near London.

SIR,—Antiquaries and antiquarian societies will be interested in the excavations and discoveries which are being made on the site of Lesnes Abbey, just beyond the London County border line at Abbey Wood. The work has the approval and support of the Archbishop of Canterbury, the Bishop of Southwark, the Society of Antiquaries, the Kent Archæological Society, Lord Avebury, Lord Northbourne, and other distinguished persons, and is being actively carried out by the Woolwich Antiquarian Society at a present outlay of about 100*l*. Already some important work has been done, some remarkable revelations achieved, and considerable light thrown upon the history of this Abbey and monastic history in general. Lesnes Abbey was one of the largest in Kent, but after the Dissolution it fell into such a ruinous condition that only a few tottering walls remained, and all the plans and descriptions which have been published concerning it for centuries past are now proved to be erroneous. This has been due to a singular frustration of good intentions.

In 1620 Sir John Hippersley, who occupied the Prior's Mansion, was quarrying in the ruins when he discovered in the church choir a stone coffin with lead lining in which were the remains of an ecclesiastic supposed to be the founder, Richard de Luci, Regent of England, who dedicated the Abbey as an act of penance to Thomas à Becket, jointly with the Virgin Mary. The body was re-buried, and Weaver the antiquary, who was Rector of Erith at the time, tells us that a bay tree was piously planted to mark the spot. In the course of the next 130 years the bay tree must have disappeared, and by mistake a later tenant has planted another bay tree in the wrong spot, where it or its successor still rears its head. The present researches show that the dilapidated wall against which the tree stands, and has been long supposed to represent the church, is really part of the refectory. The foundations of the church, an immense building 240 feet by 66 feet, have been found by digging in an orchard beyond the cloister garth. Under the choir have been uncovered a stone and lead coffin, probably those found by Sir John Hippersley, but rent open and rifled. Several grave slabs, torn from their places, have also been discovered, one bearing the name of Abbas Elyas, circa 1300, and others belonging to members of the De Luci family. Cast into a vault in the lady chapel was the effigy of a cross-legged knight, richly coloured, and bearing the arms of a De Luci of Newington, Kent, 1310-20. Under the altar of the lady chapel is a curious crypt or chamber, roughly constructed and irregular in shape, with narrow steps leading up to the church presbytery, and probably used as a reliquary. Many charters relating to the Abbey have been traced to Oxford, where they were undoubtedly transferred with the revenues of the institution by Cardinal Wolsey, and the librarian at the Vatican, who has been consulted, states that there are not in Rome any documents relating to English monastic houses, as commonly supposed in England. The excavations at Lesnes are now being extended to the chapter house, and it is hoped that the whole site may be uncovered, the cost of which is estimated at 500*l*. The Woolwich Antiquarian Society, of which I am president, is poor, and will be grateful for any help in this direction. Parties of scientific societies and others interested may inspect the remains by arranging dates, and we shall be glad to have expert advice and assistance in several doubtful questions.

Your obedient servant,

W. T. VINCENT,

Chairman and Treasurer of Lesnes Works Committee.

189 Burrage Road, Woolwich.

Lighting of London.

SIR,—A misleading impression has recently been created by certain paragraphs appearing in the Press under the above heading. The impression given was that London, instead of continuing an electrically lighted city, as at present, was about to revert to gas.

I need hardly say that nothing is further from the truth. The case, however, presents an interesting example of how easily an erroneous impression can be set afloat. The facts are as follows:—

One of the twenty-nine London authorities, influenced by conditions which were purely local, decided to alter a few of their numerous electric lamps to gas lighting. The number of the lamps involved is quite small compared with the total number of lamps in the borough in question, and is altogether negligible in comparison with the total electric lighting of London. The whole case, in fact, is simply a local matter, confined to one authority only, and is quite undeserving of this wide publicity, were it not for these incorrect rumours which have given rise to so much misunderstanding.

For corroboration of the facts, reference need only be made to the official statistics of the London County Council, where it will be seen that the use of electric street lighting has more than doubled in half a dozen years, and that only ten out of the twenty-nine London authorities are wholly without electric street lighting.

As to the relative cost of electricity versus gas for street lighting, I need only mention that in Marylebone the saving effected last year was 1,500*l*. in respect of a portion of their area only, and that this has encouraged them to convert the whole of the remaining gas lamps to electric light, which will bring the saving up to 2,600*l*. per annum.

Further, the boroughs of Hampstead and Shoreditch—already extensively electrically lighted—are extending electric lamps practically throughout the whole of their areas.

Thanking you for your courtesy in giving publicity to these facts,—I am, yours truly,

H. R. RENWICK,

Chairman of the Electric Supply Publicity Committee.

Moorgate Court, Moorgate Place, London, E.C.:
September 8, 1910.

"Duresco."

SIR,—We enclose you copy of an apology that we have obtained from David Macgregor, St. Andrews, in relation to his substituting an inferior water paint for "Duresco," which was specified, and we should feel obliged if you would publish this in your columns as a warning to others.—Yours faithfully,

For the Silicate Paint Co. (J. B. Orr & Co., Ltd.),
Charlton, London, S.E.: Sept. 13. T. JUKES (Director).

71 Market Street, St. Andrews, N.B.:
September 6.

Dear Sirs,—With reference to your complaint that in connection with the recent job done by me where your "Duresco" paint was specified an inferior water paint was used instead of "Duresco," I admit that this was so, but the substitution was not intentional, and was owing to a mistake of one of my workmen. I have offered to re-do the work free of charge with "Duresco," and apologise to you for the mistake. In consideration of your agreeing to take no further legal proceedings against me, I have paid the legal expenses to which you have already been put in the matter, and thank you for your consideration and for your acceptance of my explanation.

Again expressing my regret for the mistake,

I am, yours obediently,

(Signed) DAVID MACGREGOR.

The Silicate Paint Co. (J. B. Orr & Co., Ltd.), Charlton, S.E.

THE Ramsgate Corporation have arranged tests of modern fire alarm appliances, the arbitrator being nominated by the President of the Institute of Civil Engineers.

THE Council of the Royal Institute of the Architects of Ireland held a special meeting on the 12th inst., when the hon. secretary reported that the correspondence regarding the conditions for the Kingstown Library competition had resulted in a satisfactory arrangement, and that he was in communication with the promoters of the competition for sea-water baths at Bangor.

A SUDDEN termination has happened to the discussion in Dundee as to whether the "Old Steeple" ought or ought not to be crowned. Mr. Gilbert Scott, the architect, obtained tenders and found that the work could not be carried out for under 3,500*l*. This amount is exactly 1,000*l*. above the limit set by Mr. William Banks to his proposed donation.

MR. JAMES CUMMING WYNNES, architect, Edinburgh, has been placed first in the competition organised by the Municipality of Karachi for new municipal offices. The cost of the building was, according to the conditions, not to exceed 33,333*l*. 6*s*. 8*d*. A premium of 500*l*. offered for the selected design has been awarded to Mr. Wynnes. The main façade shows a stone building three storeys in height and 312 feet long, finished with domed features 80 feet high at each end, and having a clock tower rising to a height of 142 feet in the centre. Messrs. Groll & Treacher, architects, London, were placed second. On payment of the premium the Municipality have all rights in the design, with power to erect the building under its own agency, either according to the design selected or with such additions or alterations as it may deem necessary.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, September 24.

Society of Architects : Sketching Visit to Waltham Abbey.
Manchester Society of Architects : Visit to Leeds.
Ecclesiastical and Educational Art Exhibition, Cambridge (in connection with the Church Congress), opens September 24-30.

Monday, September 26.

Architectural Association : School of Architecture Winter Term begins.
Iron and Steel Institute : Autumn Meeting at Buxton ; five days.

Tuesday, September 27.

L.C.C. School of Building : At Ferndale Road, Brixton, S.W. Special lecture on "The History and Development of Reinforced Concrete," by Mr. H. Kempton Dyson.
Royal Society of Antiquaries of Ireland : General Meeting at Kilkenny ; two days.

Friday, September 30.

Glasgow Technical College Architectural Craftsmen's Society : Paper on "Railway Tunnel and Viaduct-construction," by Mr. W. A. Kemp, C.E.

Tuesday, October 4.

Royal Archæological Institute : Autumn Meeting at Westminster Abbey ; two days.

THE ROYAL SANITARY INSTITUTE CONGRESS AT BRIGHTON.—II.

THE following are further extracts from Mr. KIRKBY's paper on "The Design and Construction of Open-air Schools" :—

The importance of isolating the various blocks of buildings in a school of this description so that a free current of air can circulate round them cannot be too greatly emphasised. It is equally important that these blocks of buildings should be connected by a paved covered way, enabling the children to be under shelter whilst passing from one block to another.

In nearly every school built for the purpose of an open-air school the various buildings are entirely isolated, with the result that children, many of whom are poorly shod and clothed, have to sit in the class-rooms or resting-sheds with damp feet and clothes, after, perhaps, having received their meals in a warm room.

The whole of the buildings at Thackley are connected by means of a verandah, which runs in a straight line from end to end of the buildings, as this arrangement appeared to suit the site best. The buildings might, however, be grouped round a quarter circle. The site, however, will govern to some extent the disposition of the various buildings.

The remarkable physical improvement which is noticeable in children attending open-air schools suggests the consideration that some of the principles governing the planning of open-air schools might, with advantage, be extended to other school buildings, and it would appear as if these principles are destined to have a very important influence on the design of future school buildings.

In a new elementary school at Thornbury, which is being erected for the Bradford Education Committee, the principles of an open-air school are adopted.

All the class-rooms open on to a verandah facing south, the lower portion of the walls being so constructed that by means of folding doors practically the whole of one side of the class-rooms may be thrown open. The folding doors are fitted with special folding hoppers, to close up when the doors are open, and to regulate the flow of air into the class-room, when the doors are closed during inclement weather.

The principles are being adopted in a new cripple and deaf school to be erected for the Bradford Education Committee.

In view of the overwhelming evidence that exists to-day in favour of a more rational type of school planning, it is surprising that the authorities are still permitting school buildings to be erected on the old central hall plan. It seems as if, on the one hand, we are breaking down the general physique of the race, and, on the other hand, having to erect open-air schools to build it up again.

During the last ten years many millions of pounds have been spent in the erection of school buildings in England, the bulk of which have many serious drawbacks from the standpoint of hygiene.

By their convincing success the establishment of open-air schools will help to break this ignorance down, and justify the wider adoption of the principles which they connote.

The additional cost of maintaining open-air schools may militate against their expansion. Against this, however, it should be remembered that many children who ultimately find their way to permanent schools for the physically defective might have been saved this by early treatment in the open-air school, and so the greater burden and expense to the community would have been obviated. The principle of an open-air school might, however, be adopted in the planning of ordinary elementary schools at little or no extra expense.

An extended application of these principles is bound to meet with the ultimate approval of the nation at large as a sane application of those principles which make for the highest and best needs of the race.

SCHOOLS FOR SPECIAL SUBJECTS

formed the theme of "Notes on the Conversion and Equipment of Schools to be used as Special Subject Centres," by Mr. EDWARD WILLIS, who advocated distinct centres rather than adjuncts to general schools, and went on to say :—

In the writer's opinion the single floor system is by far the best where land is cheap, or where expense is a secondary consideration, but where economy is a *sine qua non*, land expensive, or not available, a useful method is to adapt existing buildings to the purpose required.

There appears to be no objection, however, to the cookery and housewifery centres being on the first floor.

Ample natural lighting is desirable in each centre, and, where possible, handicraft, laundry and cookery rooms should be provided with roof lighting. This, of course, is not possible in two-storey buildings, and in such cases windows should preferably be provided in at least two external walls.

The artificial illumination of all rooms should, where possible, be effected by incandescent electric light attached to balance pendants over the benches, desks, and tables, with brackets near the stove and fireplaces. If gas only is procurable, two or three light pendants (according to the size of room), with ball and socket heads, give the best illumination, providing incandescent mantles and reflecting shades are used. The inverted mantles, with proper shades, reduce shadow, and if properly disposed, give an excellent diffused light.

It is probable but few centres would be required in localities where neither gas nor electric light is available, but should such be the case, the writer would recommend acetylene or petrol gas in preference to lamps, as he is of opinion the cleanliness and ease of working a small installation is much superior to ordinary oil lamps, but should these latter be used, he must emphasise the necessity of metal reservoirs.

As a rule the warming is provided by means of hot water pipes or radiators, but open fires have many advantages, and if properly disposed and protected in existing build-

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ings, can generally be utilised at a nominal cost. This applies especially in the case of cookery, laundry and housewifery centres, as it is usual and helpful for students to have continual practice in laying, lighting and maintaining good fires in ordinary household grates and kitcheners, and not rely entirely on cooking by gas to avoid the trouble incidental to ordinary coal fire stoves or ranges.

Ample fresh air should be obtained by means of large windows always opening for their total height, the upper edge being near the ceiling level, and this should be supplemented with inlets and outlets, and wherever possible cross ventilation, the inlets being placed near the open fires or behind the radiators, if provided, and the outlets in or near the ceilings.

In the dwelling rooms of the housewifery centre, the local byelaws should be observed, and should a bedroom not be provided with a fireplace, the usual ventilator in an external wall is necessary.

The sanitary offices are better kept in a separate block as in elementary schools.

The permanent equipment of a handicraft centre, which should provide at least 35 square feet per boy, should include all that is necessary for 20 or 40 boys, the former being the maximum number allowed in a single class under one certified instructor, and it is seldom in a fair-sized town that more accommodation than the latter is required, since under the present Board of Education syllabus, a centre for 40 boys means instruction for 400 boys per week, which is, except in large manufacturing cities and towns, probably the greatest number likely to be old enough for manual training within a reasonable radius of the centre.

The permanent equipment consists of timber racks, which should be horizontal, as the vertical rack is often dangerous for boys; with cupboards or lockers, which are designed with at least ten separate compartments, and usually not more than twelve, forming a division for every class wherein the drawings and work are stored each week; museum cupboards with glass fronts, where all the models are stored when not in use, and the best examples of students' work should be kept for inspection; instructors' desks and lock-up cupboards for their own private use; students' lockers, in which the students have similar privileges. Note.—These latter are not always provided; blackboards and drawing appliances; dual benches and tool racks; grindstone, preferably fitted with Illesley's patent grinding apparatus, and a complete set of tools for the centre, with usual ordinary tools for every student.

The area in the general cookery demonstration rooms must be at least 25 square feet per girl, but if these are used for lecture rooms as well, which is usual, and existing buildings are converted, a margin is advantageous, and this especially useful if galleries are formed for the desks, and the laundry work is taught in the same room.

A larder or pantry with window and ventilator in an external wall, should be provided for each cookery class, and also in the housewifery centre, but this latter can be omitted and one of the former utilised for demonstration purposes.

A difference of opinion exists as to the position of the sinks, some teachers preferring the sink kept away from the wall so that access can be had all round both sink and teak draining board, which enables more girls to have experience in washing up at one time, while others prefer the usual position against a continuous wall, or in an angle as being more practical. The depth and quality of the sink is a matter of choice, but the writer prefers a deep white glazed (all over) type with upright waste and flap, it being more easily kept in a cleanly condition, or more apparent if not kept clean.

A tile or cement floor underneath and around same for at least two feet is desirable in new work, but a lead safe will meet the necessities of the case in old buildings. A similar floor is advantageous in a laundry centre, if on an upper storey, where the copper and wringer usually stand, as also underneath the washing stools.

In the case of housewifery combined with laundry and cookery, the accommodation should be, sitting room, bedroom, kitchen, scullery, store, coal cupboard, larder, and water-closets, whilst a small bathroom is desirable. It will thus be seen, the lecture room is entirely done away with, and the Board have recently sanctioned the omission of kitchen and scullery where the combined cookery and laundry room adjoins, and is included as part of, the "combined centre." The internal water-closet should primarily be used for demonstration purposes only, the children's offices being provided if possible in the playground, clear of the building.

The actual arrangements for decoration, stoves, blinds, fittings, &c., should be largely in the choice of the head teacher, but the author's suggestions are to make the rooms, as nearly as possible, equal to the better class of cottage or suburban villa, having as much variety as convenient.

General cookery rooms should be provided with desks for class work, preferably on two or more galleries, and in this case the dual form required in elementary schools can be dispensed with and the long continuous desks adopted, allowing about 1 foot 6 inches to each girl. A similar space must be given to every child on the central table in the cookery centre, the width of 1 foot 6 inches to 2 feet being absolutely necessary.

Teachers differ as to the arrangement and construction of cookery tables, some preferring the enclosed type with cupboards, whilst others prefer the open tables with solid top, and just one shelf below to place the utensils upon when not in use. A good arrangement is to have a capital E form, the top and bottom tables being 6 feet long, the long side being made up of two more each 7 feet 6 inches long, and the middle being a table of about 2 feet square, to carry a grilling and boiling gas stove without an oven.

This gives an excellent arrangement for demonstration purposes, and if a complete gas cooking stove with an ordinary kitchener are also provided inside the E against the wall, the students have an excellent opportunity of seeing the whole of the demonstration. Two cupboards for work, books, &c., are desirable, and a large dresser with the usual drawers and lower cupboard. Hot and cold water is also useful at the sinks, and the former can be suitably arranged by the provision of a high pressure boiler at the back of the kitchener.

Where the laundry work is to be carried out in the same room, extra area is desirable as already mentioned, and by arranging the cookery table as described above in four sections, this can also be used for ironing in a different position.

Nine washing stools will be necessary, also a proper copper, or in lieu of this latter a gas fired copper with a cold water supply above and a draw-off tap below. An ironing stove will also be required for about twenty-seven plain and nine smoothing irons, and to the roof should be suspended by pillars a complete system of drying frames, easily raised or lowered, which would reduce the usual number of clothes horses.

In the foregoing the writer has briefly described the general accommodation and equipment required in a combined centre for thirty-six girls, which will give facilities for the education of 360 students per week.

The general trend of the criticism on these papers, although approving of the open-air idea, was that there was too great a tendency towards undue expense and needless refinement of elaboration in details. In short, that school specialists were following the example of hospital and workhouse designers and overrunning the constable.

In the section of the Congress that devoted itself to a conference on the Hygiene of Childhood, Mrs. A. W. CLAREMONT presented a short paper on "Open-air Education," in which was specially advocated the provision of open-air play-gardens rather than of indoor Kindergartens. As far as the architect is concerned all that he is required to provide under this scheme is "a rough shed-roof covering part of the space for use in wet weather, and movable wind-breaks, either board or canvas, which could be put up on the north and west sides in winter."

Dr. W. H. SYMONS advocated, in a short paper, that instead of the Hinckes-Bird board and the Tobin tube, which he condemned as inadequate, modified forms of window, admitting more air, should be used in one of three devices—"the open bay window, the double-fan window, and the baffle-plate sash window." These he described thus:—

The open bay window is a window formed by adding a third sash to a double-casement window. The third sash is hinged on to one of the half-casement windows so that when the casement is open it may unite the two halves in front and prevent wind from blowing directly into the room, but the bay being open top and bottom there is free air communication with external air; even in a gale the open bay will be found to shelter the interior, but it does not furnish sufficient protection against beating rain unless the upper opening is protected above by a fan hung from the top outwards.

The double-fan window was devised to prevent rain from beating in at the sides. It consists of an outer fan hung

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from above and an inner fan hung from below, the inner fan being furnished with an efficient weather guard to carry off the rain.

The baffle-plate sash window is not nearly so efficient as the open bay, but it is a great improvement on the Hinckes-Bird arrangement and less disfiguring. The baffle-plate is a piece of glass fitted into the outer stone frame of the window opening. The glass should be the full width of the opening, about 9 inches deep, and fixed either flush with or not more than 2 inches below the head of the window. The glass of the upper sash of the window should terminate 9 inches from the top of the sash, and the inside blinds should be hung about on a level with the free margin of the glass.

(To be continued.)

NOTES AND COMMENTS.

IN the competition for additions to the Queen's University, Belfast, fifty-seven sets of designs have been received, which looks satisfactory for the trial of the new system of reducing to a minimum the labours of competitors. It will be remembered that the plans, elevations, and sections were to be drawn to the scale of twenty feet to an inch, and the number of drawings is as small as it could possibly be to show the schemes of the various designers.

LIVERPOOL'S citizens are chary of trusting their town hall to the skill of the enterprising American engineer who is prepared for 30,000*l.* to move it bodily some twenty feet from its present position. The only excuse for the operation is the reduction of the congestion of traffic at the junction of Dale Street, Castle Street, and Water Street, but its appearance would scarcely benefit —indeed, it would suffer from the alteration. The Finance Committee of the Corporation has asked the City Engineer to report on the proposal, which we do not doubt is quite practicable though we think scarcely advisable.

THE Newcastle City Council has determined not to take any steps towards acquiring for the town Jesmond Towers and its 11½ acres of grounds, or even to consider the advisability of taking such steps. The Council seem rather to have been influenced to this decision by the fear that if they evinced a desire to purchase the price would go up. We do not think the Council wise in their decision, as we are strongly of opinion that antiquities and open spaces are always sound investments for a Corporation.

BIRKENHEAD Town Council has resolved to adopt the Town Planning Act in terms of the following motion:—"That having regard to (a) recent legislation, (b) prospective building arrangements within the town, it is desirable that a committee of the Council be appointed to consider the future development of the borough as to (1) the laying out of new areas, (2) the improvement of areas already built upon, (3) the provision of a town plan, and to report to the Council." It was also resolved:—"That such committee consist of the Road and Improvements Committee, with authority to call into consultation such other members of the Council as might seem desirable, and obtain all necessary information."

THE present bridge across the Dee at Llangollen, although widened in 1873, has been found not only inadequate but dangerous, and it has been determined by the Llangollen Urban Council and the Denbighshire County Council to carry out a scheme for widening it by twelve feet. Considerable opposition has been offered to the scheme, but only the new part of the bridge—that placed in position in 1873—will be touched, and, as in that year, the work will be carried out with jealous care to preserve in every way the characteristics of the old work, as it is admitted was successfully achieved thirty-seven years ago. The whole of the enlargement proposed now, as then, will be on the west side, the old bridge remaining intact on the east side. The old bridge will form the model for the present as it formed the model for the last, and after both have been erected its ancient lines and stones will still be jealously guarded in their original position.

CHETWYND HOUSE, Stafford, is to be remodelled, it appears—at any rate, internally—to serve as a new post-office, and the proposal has evoked considerable adverse feeling, for the building is considered of very great historic interest and an exceptionally fine example of eighteenth century architecture. It was built by Mr. WILLIAM CHETWYND, who was born in 1684. In early life Mr. CHETWYND went into the diplomatic service, afterwards representing Stafford in Parliament. In 1717 he became a Lord of the Admiralty, and was twice defeated for Parliament at Stafford, but returned elsewhere. In 1734 he again represented Stafford, and retained the seat until his death in 1770. At a meeting of the Town Council it was resolved, "That in carrying out any alterations to Chetwynd House which may be considered necessary, this Corporation hopes that the Postmaster-General will respect, as far as possible, the wishes of the town that such a very fine example of eighteenth century architecture be preserved."

UNIVERSITY COLLEGE, LONDON.

THE Session of the School of Architecture at University College begins on Monday, October 3. In addition to the regular work of the school, the following public courses of lectures have been arranged owing to the generosity of the Carpenters' Company:—A course of three lectures on "Town Planning," by Mr. H. V. LANCHESTER, F.R.I.B.A., beginning Thursday, October 6, at 6 P.M. Mr. ROBERT COBAY, the Master of the Carpenters' Company, will preside at the opening lecture. A course of eight lectures on "English Domestic Work," by Mr. J. A. GOTCH, F.R.I.B.A., beginning on Thursday, October 27, at 6 P.M. The Design Class that has been arranged to meet the needs of those already at work in architects' offices, and which is held under the direction of Professor SIMPSON and of the special visitors, Mr. LEONARD STOKES and Mr. ERNEST NEWTON, will meet on Mondays and Wednesdays at 6.45 P.M., beginning Wednesday, October 5.

THE SPIRIT OF THE DALES.—III.

AN ESSAY ON YORKSHIRE HOUSES.

(Concluded.)

THERE is Marley Hall, as plain as any farmhouse could be, yet how well suited to the fierce storms and the moorland wind. Nor does it lack distinction, for what could be more charming than the little gate by which one enters on the flagged path to the door, with heraldry above, and there is sufficient character in the very masonry to supply the place of any ornament.

And lastly let me remind you of Kildwick Hall, which lies by Aire Side between Keighley and Skipton, finely placed on rising ground. Kildwick has magnificent stone gate-piers with lions above them, and is, in its exterior arrangement, more grandiose than are the bulk of Airedale houses.

Leaving the Brontë country again and crossing by Skipton into Upper Wharfedale, we find many stone-built villages set in some of the most beautiful scenery our country possesses. Everyone knows something of Wharfedale, and certainly the majority of those who know it are familiar with Bolton Abbey. Even if Turner had not immortalised it, even if it did not possess a well-deserved reputation, there would still be for most people the tendency to look at it and admire it because it is a church—and to ignore or decry the Rectory because it is a house.

This is a legacy of the Gothic Revival. Horace Walpole a century and a half ago admitted no architecture between the Middle Ages and the days of Inigo Jones; jeered at the tapestries and galleries of Hardwicke. The Gothic revivalists "went one better," so to speak, and architecture for them stopped dead about the year 1300.

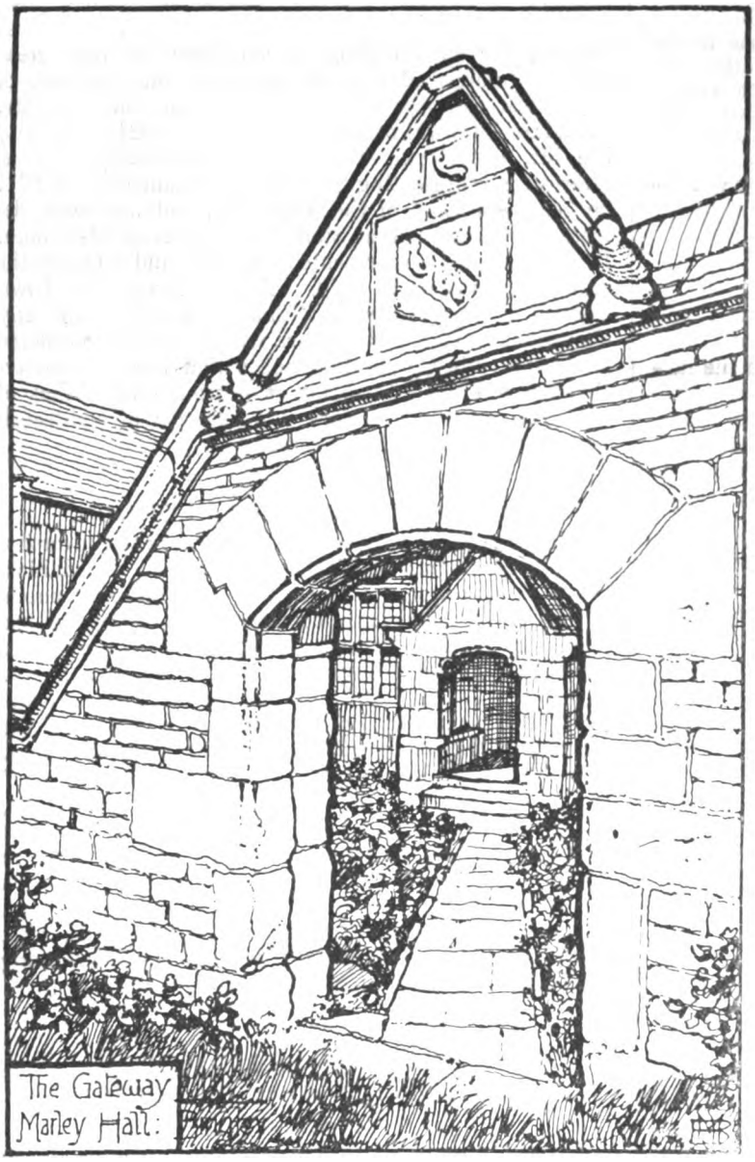
Considerable alteration has been made to the windows since they were built, by the removal of the old stone mullions and the substitution of sashes.

In this district there are many small stone houses of

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varying interest, the Grammar School at Burnsall, with its regular and complete front, being the best known.

But at Appletrewick, just across the valley, are two little buildings, so quaint, so interesting, and so uncommon, that I make no apology for introducing them into this paper as typical of the oldest stone architecture of the dales.



The Gateway Marley Hall.

Scattered about on the fell-sides, huddled together in grey villages and wind-swept hamlets, you may travel far in this country of ours and find nothing more peaceful, nothing more reminiscent of bygone days, than these lonely homesteads of Upper Wharfedale.

Not that Wharfedale has a monopoly of such things, for in most of the market towns of the upper dales, where the market-place bursts into life for the great sheep fairs and where the dalesmen make their infrequent visits to civilisation of a sort, you may in most cases find a many-windowed house of stone with its picturesque gables commanding the cobbled square. There is such a one, as you see, at Askrigg.

And if you should happen to visit Settle you will find another very similar, bearing the name of "The Folly," for no particular reason that I am aware of.

Of the rougher and lonelier sort, far from the haunts of men and the pleasant clatter of happy tongues, I mention as an example Gouthwaite Hall, near Pateley Bridge, which has been rebuilt close to its former site, now covered by the great reservoirs which supply Bradford with water.

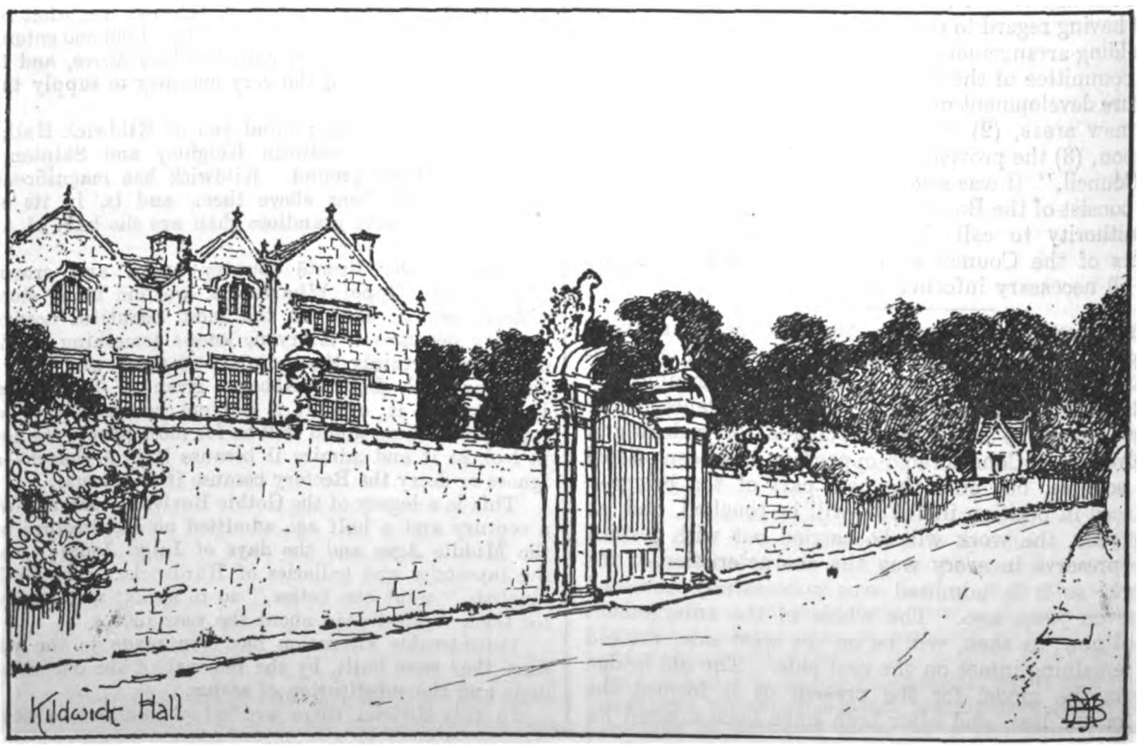
I will not leave my story bereft of its proper ending, and I will certainly not spare you a moral. Indeed, I am told that the majority of folk only care for dissertations when some great moral truth—preferably startling and usually very deep—is carefully produced from apparently prosaic subjects, very much as a conjurer produces a bevy of dancing girls from an apparently innocent cherry-stone.

And in a measure I must disappoint you, for although a special gift of tongues seems to be vouchsafed to every layman who writes on architecture, woe unto the architect who lets his imagination run beyond the end of his tee-square. So I dare not follow up my alluring theory of the Spirit of the Dales.

But I will instead substitute a few undeniable facts and a moral.

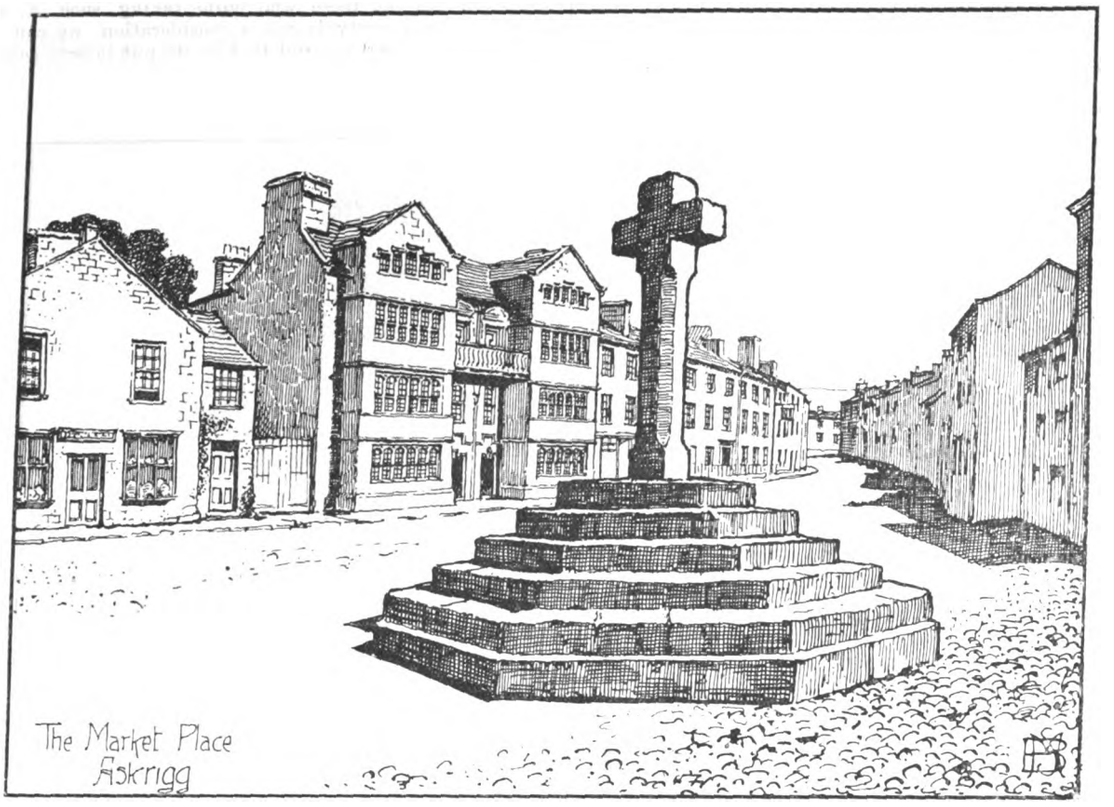
You have seen how the Gothic tracery of Kiddel Hall and the fortified state of Barden Tower gave place to the idea of "houses for people to live in," a phrase attributed to the genius of Ibsen.

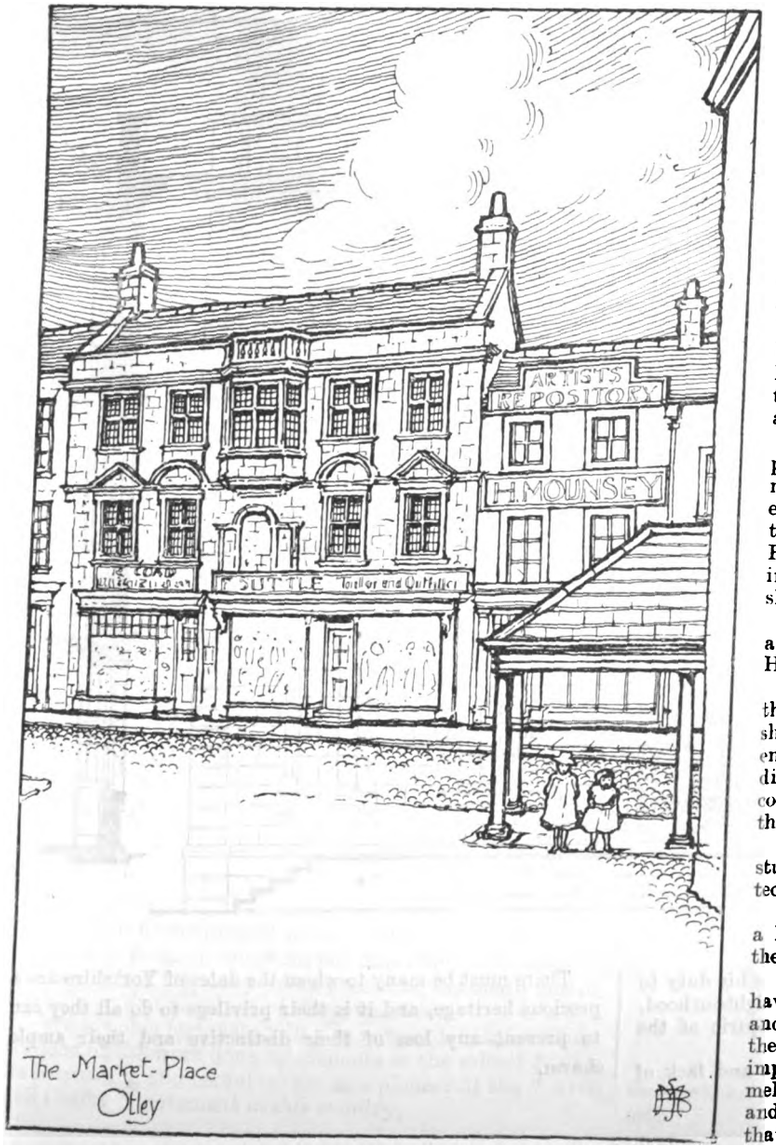
And now in the eighteenth century the architecture of convention began to replace that born of necessity. We find more Classical elements



Kildwick Hall

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creeping in, and this drawing shows you how they arrived in Otley market-place. Not that this drawing is above suspicion. If you went there nowadays you would find the inhabitants have taken out the leaded glazing and substituted plate-glass, and in a violent fit of civic pride have raised a clock-tower in the square which certainly does not harmonise with the Spirit of the Dales. But I have ventured to depict it as our grandfathers would see it.

Just under the lee of the long railway viaduct at Arthington, near Otley, is a little stone house named Castley Hall, where we see the Georgian style matured, and notice that almost every vestige of local character has disappeared. Indeed, but for the stone slated roof this little building might be transplanted to almost any English town and not look much amiss. With this exception one finds no fault with so admirable and so simple a design.

Then at Leathley, on the way to Otley, the post office is in a sort of Georgian manner, and may have been the work of Carr, of York, an eighteenth-century architect who has lately been the subject of some study, and who built at Harewood, near here, a whole Georgian village in Yorkshire stone, with roofs of the local stone slate.

As my last example I give you the old house at Leeds, which stands at the foot of Hartley Hill, overlooking North Street.

It is Georgian, of excellent design, and all that a formal stone house should be. But it shows how the eighteenth century witnessed the end of a period when Yorkshire architecture was different from that of all other parts of the country, when the local masons built purely by their own tradition.

And what moral can I find you from this study of a century or so of a bypath of architectural history? I can think of only one.

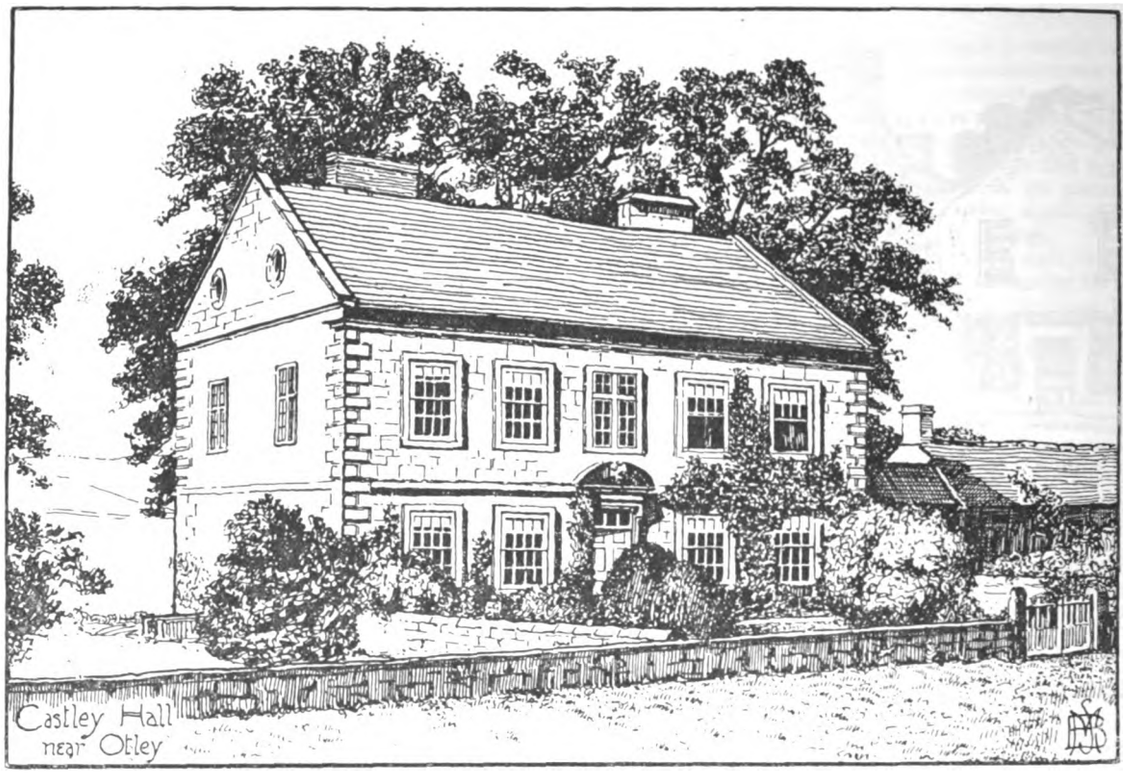
It only falls to the lot of a few of us to build a house for ourselves, but it seems to me that the act involves a certain responsibility.

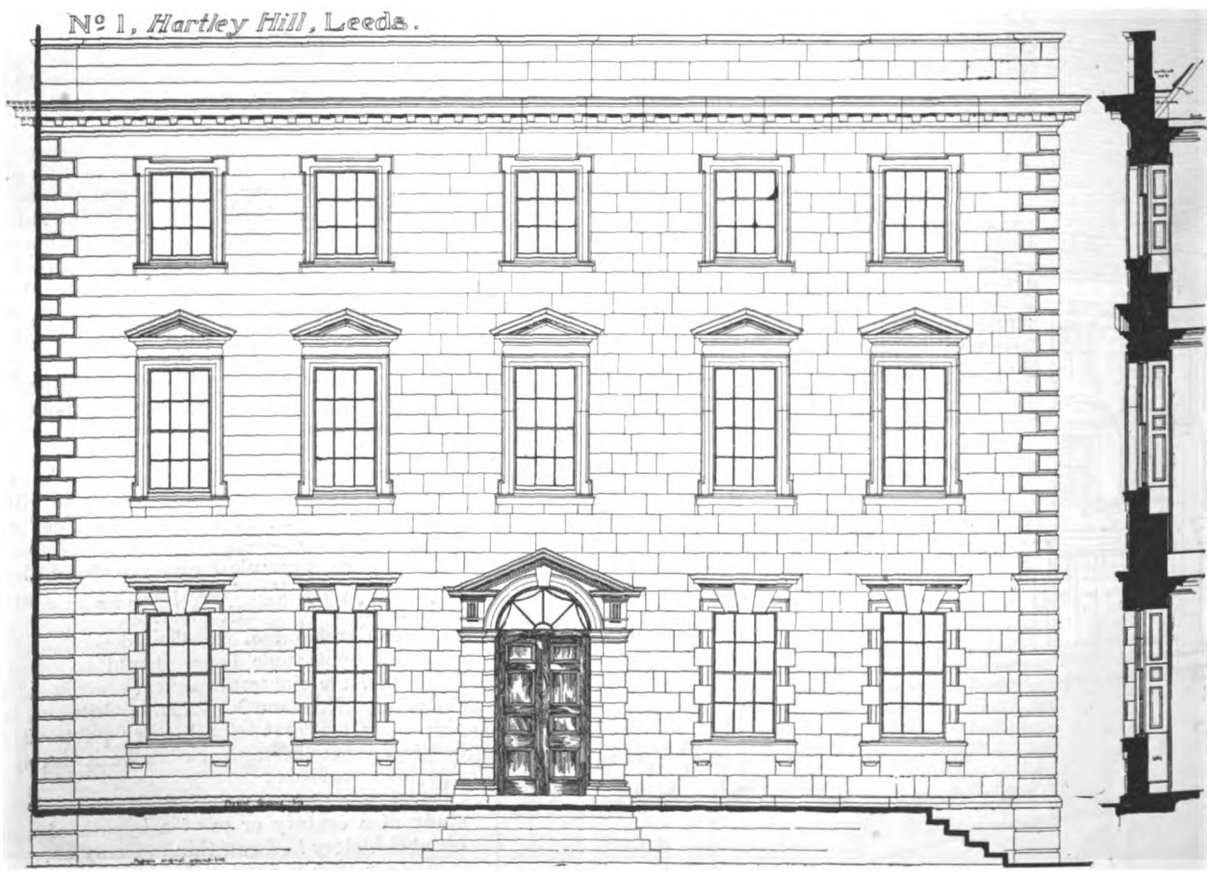
Those of us who live in the Yorkshire dales have a certain responsibility thrown upon us, and I cannot believe that Providence made these grand hills of fine stone with a view to our importing red bricks and making ludicrous and melancholy efforts to reproduce the tints of Kent and Sussex on our roofs and walls. Why is it that Ilkley—Ilkley that boasts of Boticelli wor-

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shippers and Dante students, cultured Ilkley, in fact—is so cosmopolitan in its architecture, so slapdash and so out of tune with its surroundings? Only because the Ilkley merchant, who makes his pile elsewhere and takes refuge here when the pile is made, does not realise that it is his duty to mankind to do something to beautify his neighbourhood, and that he must be in harmony with the Spirit of the Dales.

There are some places where sheer poverty and lack of education prevent those who build taking such a view. Surely, when poverty is not a consideration, we can only assume the alternative, and that is—to put it very gently—poverty of ideas.



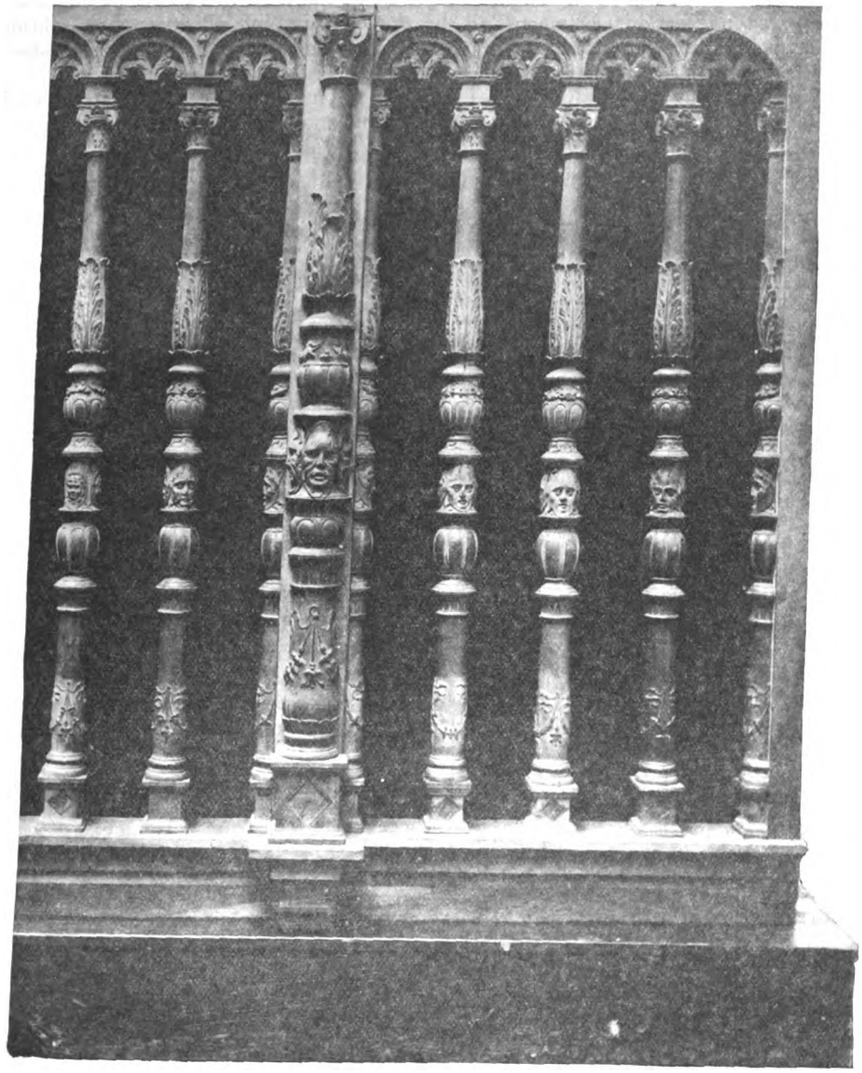


There must be many to whom the dales of Yorkshire are a precious heritage, and it is their privilege to do all they can to prevent any loss of their distinctive and their ample charm.

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SCHOOL OF ART WOODCARVING, SOUTH KENSINGTON.

AMONG the industrial arts which contribute to the artistic environment of the individual none is more important than the work of the craftsman in wood. Its interest to the architect is second only to carving in stone, as by the means of woodcarving beauty of form and warmth



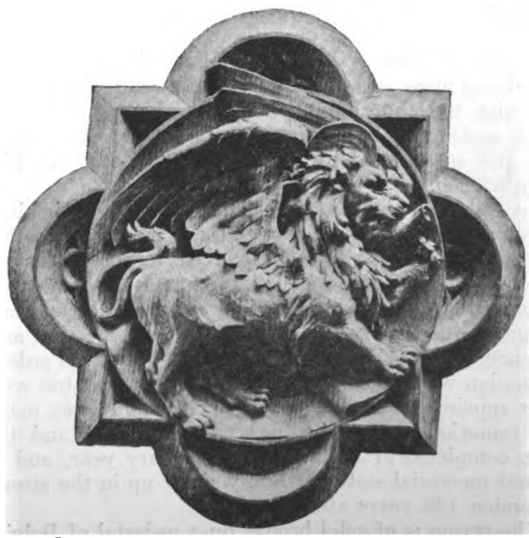
of colour is often imparted to what would otherwise be a cold and dreary space, whilst application to furniture and fittings commands the admiration and gratitude of every architect.

One of the efforts of a generation ago for the revival of the applied arts in England still vigorously survives in the School of Art Woodcarving, South Kensington. Founded in 1878 by a small body of artists, and financed in the first instance by the Worshipful Company of Drapers, it has trained an ever-increasing number of art workmen and teachers of woodcraft, whilst its doors have not been closed to anyone desiring to obtain an insight into the virtues and difficulties of woodcarving.

The eminently practical character of the work of the school has at all times drawn to its Committee members of the various artistic professions. The President of the Royal Academy has been associated with the school since its inception to the present time, and the late Mr. GEORGE AITCHISON, R.A., at one time put important work into its hands; he was for many years preceding his death one of the most active members of its Committee.

We are able fortunately to give our readers a few illustrations of the work done by students in the school during its interesting and useful career as a pioneer of the "Arts and Crafts" movement in this country.

The diploma or certificate of the school, which is usually obtainable after three years' study and practical work, is becoming very valuable, and this is due largely to the Committee, despite many temptations, refusing to lessen the stringency of the conditions either of its theoretical or practical work set out for the diploma course. However, a very useful insight and appreciation of the principles and practice of the art of woodcarving may be gained by the shorter courses arranged to meet the wants of those students who cannot devote their whole time to the art.



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The *Journal of the Royal Society of Arts* (July 1910), commenting upon the work of the students recently exhibited at the schools, says:—"There are plenty of large art schools and some quite successful 'trade' schools teaching a variety of subjects, but schools where one trade and one trade only is taught by a thoroughly skilled workman—part of whose time is spent working under trade conditions, and whose teaching is supplemented by lessons in design and the kind of drawing which will prove useful to the pupils in their career—are too few and far between."

This confidence in the school is fully warranted by the notable successes which have been gained by the students this year both at the Exhibition of the Worshipful Company of Carpenters and the National Competition held at South Kensington. A year or two ago the school was awarded the diploma of honour at the Franco-British Exhibition.

ILLUSTRATIONS.

THE LONDON AND PROVINCIAL BANK, LTD., MAIDA VALE BRANCH.

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The statue is of solid bronze on a pedestal of Belgian marble. The whole is over 12 feet high. The doctor is shown raising his eyes from a book which is lying open on his left hand, and he is enforcing his explanation with upraised arm and closed fingers. He wears the well-known wig. The head is modelled partly from NOLLEKENS's and partly from REYNOLDS's familiar portraits. The pedestal is richly decorated with an elaborate border wrought in bronze representing flowers and running round the base. In front there is a medallion with a profile of the faithful BOZZY; at one side a bas-relief of the doctor tramping through the Hebrides arm-in-arm with his friend; on the other he is shown paying his devoirs to Mrs. THRALE.

The bronze castings were the work of Messrs. ROSELIEB, and the marble work was executed by Messrs. WILKINS.

TECHNICAL SCHOOLS, CORK.

THIS building is now in course of erection on the site of a disused brewery close to St. Finbar's Cathedral, at Cork. The law relating to municipal technical schools in Ireland gives no aid to local bodies for borrowing money for building purposes; but the Cork Technical Committee, after considerable negotiation, was permitted to capitalise an annual grant of 800*l*., allowed for the teaching of new industries, and to spend the lump sum on a new school, which was badly required. The capitalised grant realised something less than 16,000*l*., and would have been insufficient to meet the requirements of the committee had not one of its members, with commendable public spirit, secured the site at his own expense and presented it to the citizens. In planning the new school, since it was necessary to study every economy, advantage was taken, as far as possible, of the old buildings and old materials that the site contained, and some of the former were rearranged to form workshops for mechanical trades. The illustration shows the new front building to the street. The ground floor of this chiefly contains the administration department and a large entrance hall, which it is proposed also to use as a trade museum. On the first floor are a number of class-rooms, and on the second floor chemical laboratories, and a lecture-room connected therewith. The front is being executed with Ballinphellig red facing brick, and white limestone dressings from local quarries. The general contractor for the works is Mr. SAMUEL HILL, of Cork, while the fire-proof floors are entrusted to Messrs. HOMAN & RODGERS, of Manchester, and the heating and ventilating to Messrs. G. N. HADEN & SONS, of Trowbridge. The architect is Mr. ARTHUR HILL, B.E., F.R.I.B.A.

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The *Journal of the Royal Society of Arts* (July 1910), commenting upon the work of the students recently exhibited at the schools, says:—"There are plenty of large art schools and some quite successful 'trade' schools teaching a variety of subjects, but schools where one trade and one trade only is taught by a thoroughly skilled workman—part of whose time is spent working under trade conditions, and whose teaching is supplemented by lessons in design and the kind of drawing which will prove useful to the pupils in their career—are too few and far between."

This confidence in the school is fully warranted by the notable successes which have been gained by the students this year both at the Exhibition of the Worshipful Company of Carpenters and the National Competition held at South Kensington. A year or two ago the school was awarded the diploma of honour at the Franco-British Exhibition.

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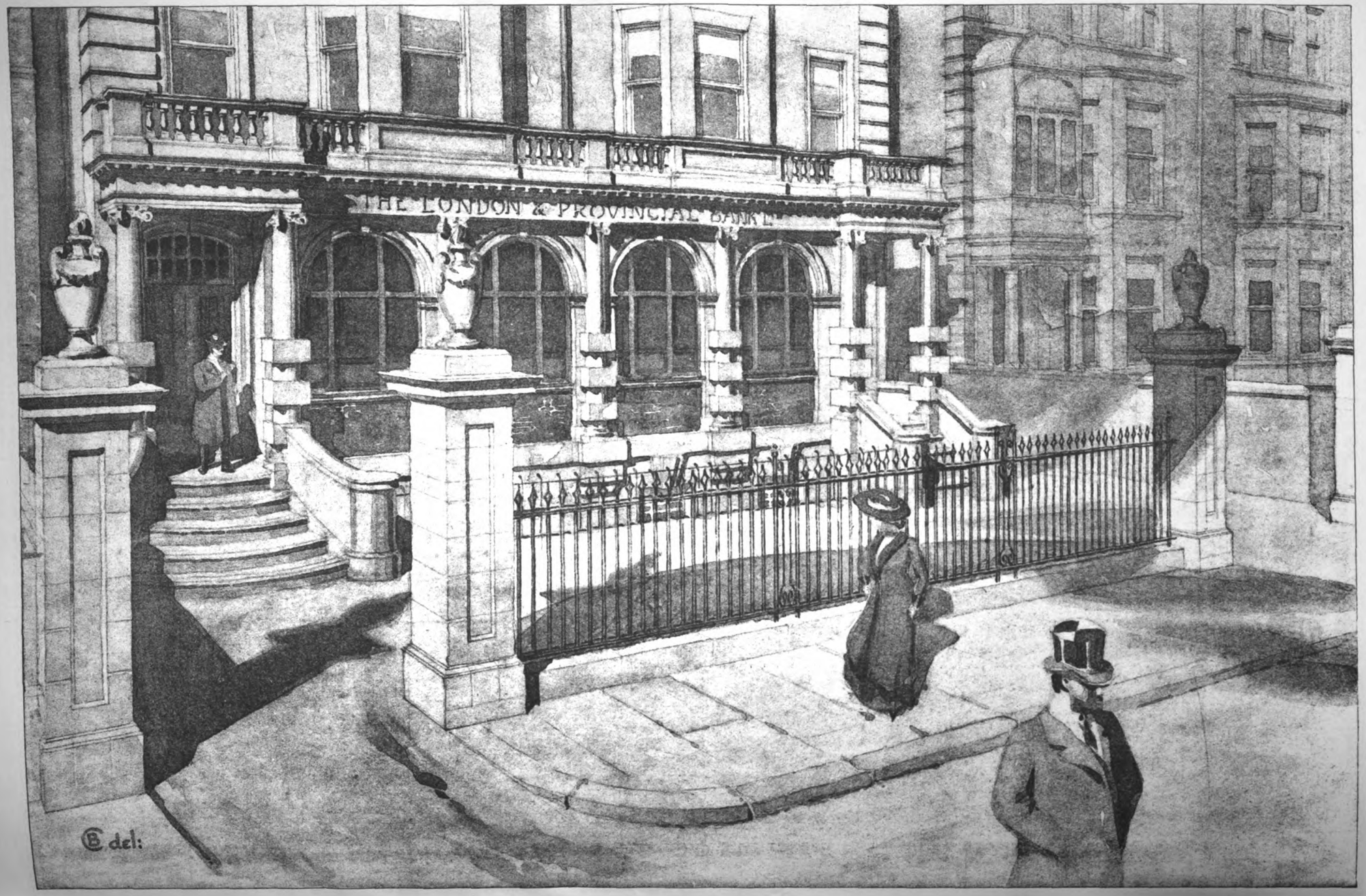
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Royal Academy Exhibition, 1910.

LONDON AND PROVINCIAL BANK, MAIDA VALE.

Messrs. BANISTER FLETCHER & SONS, Architects.

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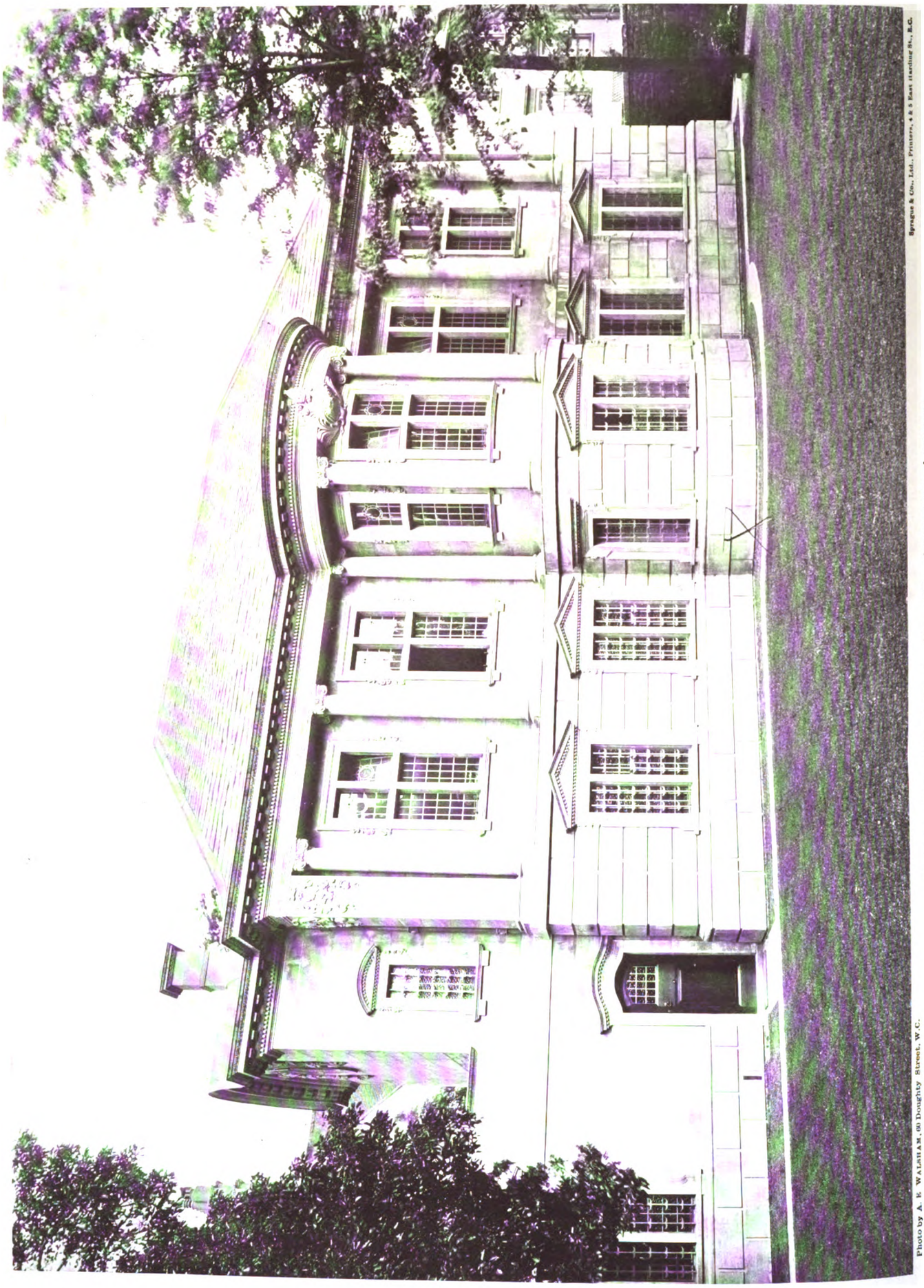
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THE JOHNSON STATUE, ST. CLEMENT DANES, LONDON.

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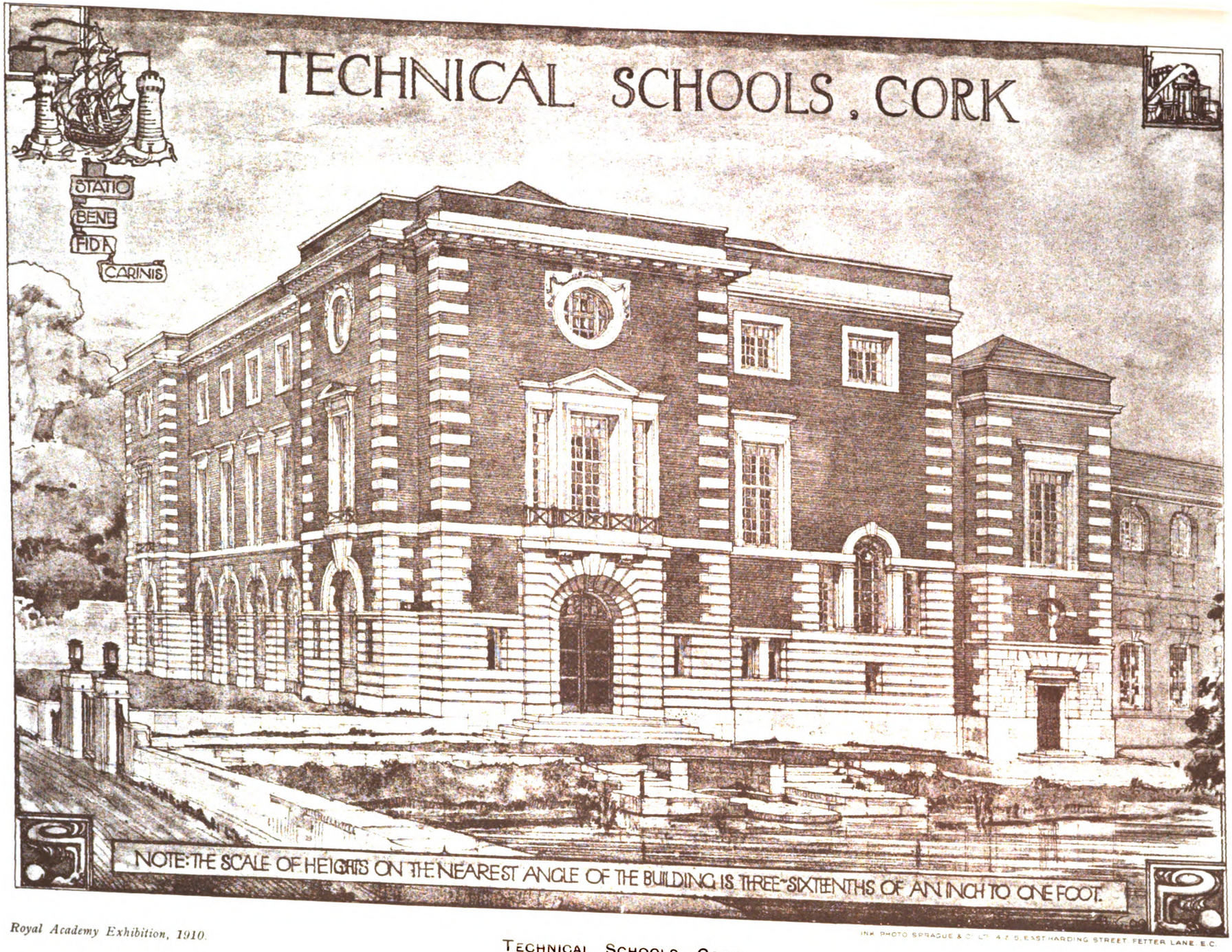
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Royal Academy Exhibition, 1910.

TECHNICAL SCHOOLS, CORK.

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MODERN COLD STORAGE AND REFRIGERATION.

By W. S. DOUGLAS, B.Sc.

XIX.—ABATTOIRS (*continued*).

IN Germany, as stated in the last article, abattoir construction is more advanced than in England. Very many large and well-equipped abattoirs are to be found there, and one of the best, if not actually the largest, is that at Offenbach am Main, of which we propose to give a brief description.

The general appearance of the place, as viewed from a neighbouring eminence, is seen in fig. 56, which, together with the other illustrations, is taken from the *Zeitschrift für die Gesamte Kälte-Industrie*. Prominently situated will be noticed the water-tower, administrative buildings, and restaurant, the last two being on the left- and right-hand sides respectively of the main entrance. The other buildings will be explained in due course, but note should be taken of the central covered-in passage, which leads right through the abattoir and provides free access for carts and vans.

In fig. 57 is given a ground plan, from which we can follow the course taken by the various animals in their progress through the abattoir. Different animals are, of course, differently dealt with, and, for the purpose of separating out the various types, they have been classified under three heads—large cattle, small cattle (principally sheep and calves), and pigs. Each of these three divisions pursues a separate path.

Starting from the westward end of the abattoir (right of the illustrations), where the railway siding is, the first objects we come to are the unloading platforms, one of which is provided for each of the three classes. Exactly opposite these are three sets of pens, and beyond these again are the three killing halls, all fitted up with killing tackle suited to the animals dealt with. The larger cattle are tied to killing rings in the floor and poleaxed, the smaller are killed lying on their backs in cradles, and the pigs are stuck with the sticking knife.

All are then hoisted up by self-sustaining hoists, skinned, cleaned, dressed, and fixed to the hooks on the running carriages, the larger cattle being previously split. The carriages, travelling on the overhead runways, then convey the carcases to their respective hanging rooms on either side of the chill room, crossing on the way the covered-in passage. Large and small cattle go to the south hanging room, in which various branch lines, connected by cast-steel switches to the main tracks, together with hook racks on the walls, have been provided for their reception (fig. 58), while the north hanging room is devoted to the pigs alone. The animal heat having been dissipated, all are then deposited in the chill room.

Mention may be made, before proceeding to the refrigerating plant, of the various subsidiary departments. Amongst others, a special place has been provided for dealing with horses. These are killed in the small block of buildings located at the south-east corner, and are afterwards taken to a small cold chamber situated just over the main chill room.

Another department is that dealing with offals and diseased meat, which consists of a second small block of buildings situated in between the cooling room block and the horse department. The diseased meat itself comes from the room next the horse-slaughtering hall, where the infected cattle are killed. Lastly, over in the south-west corner are the rooms devoted to the treatment of hides.

Turning to the freezing plant, there are in addition to the two hanging houses and the chill room, measuring 74 feet by 125 feet, a pickling cellar for bacon, and also the small cold room for horse flesh mentioned above. All these are contained in the one block of buildings, measuring 97 feet by 209 feet, and adjacent to them are the various rooms containing the compressors, steam engines, ice plant, boilers, and accessories.

To keep the property of each butcher separate from that of the others, the main chill room has, as usual, been divided into cubicles made in round bar iron with wire work roofs (fig. 59). These are numbered and provided with padlocks, and the owners keep the key of the cubicle, or cubicles, belonging to them, a master key being retained by the authorities for inspection purposes. When required, the meat is removed from the chill room by the main entrance (fig. 60), which opens on to the covered passage, and free access is therefore easily obtained for carts and vans. In front of the entrance in fig. 60 will be noticed the trackways coming from the slaughtering-hall for small cattle. They are carried by rolled steel joists supported, as shown, from the brickwork.

Northwards of the cold room block is the group of rooms containing the machinery. The principal part of this, including the compressors, steam engines, and dynamos, is located in the main engine room, while just beside this room is the boiler-house, and running along its southward end, separated from it by the water-tower steps, is a passage, which communicates direct from the central thoroughfare to the ice-making tank.

Starting at the very origin of the power, coal is brought in from the street close by to the bunkers in front of the boiler-room. In this way, it should be noted, it is kept quite separate from the other departments, and danger of flying ashes, grit, &c., getting in to the meat is avoided. It is then brought in to the boilers, of which there are two, both of the twin-flue horizontal pattern, provided with a chimney 132 feet high, and steam is generated at a pressure of 180 lbs. per square inch. The hourly capacity of each boiler at this pressure is 6,600 lbs. of steam. Leaving the boilers, the steam passes through superheaters, which raise its temperature to 518° Fahr., with most beneficial results, as engineers are aware, in reducing the steam consumption of the engines. Finally, it is conveyed through the main steam pipes to the engines themselves.

Water is fed into the boilers by two feed pumps, of 1,300 gallons hourly capacity each, and there are also injectors to act as stand-bys should the pumps break down. In addition, the water passes on its way through a softening and purifying apparatus to prevent the deposit of scale (due to the sulphates and carbonates held in solution in the water) on the inside of the boiler plates.

Next in natural order are the steam engines. Two of these are of the tandem compound horizontal type, and develop each, when connected to the jet condensers beneath the engine-room floor, 177 indicated horse-power. The third has only one cylinder, and is used to drive the third compressor if unusual pressure is thrown on to the cooling plant. Otherwise it is connected to the two dynamos which supply current for lighting the building and for driving small motors.

The air pumps for the jet condensers are also driven by the main engines, but the other pumps for the brine of the refrigerating system, water for the ice tank, &c., are driven by separate motors. One of these is employed to circulate the cooling water from the jet condensers, except such part as goes to the feed pumps, over a cooling tower, just south of the ice tank. It is sufficiently cooled therein to be used over and over again.

Having now examined the means of generating power, we come to the main purpose for which it is used—namely, the refrigerating system. This we can separate up into our three fundamental units: the compressors, the condenser, and the evaporator. The refrigerant used in the system is sulphur dioxide, and it is compressed, taking the first of our units, in three compressors built by Messrs. Borsig & Co., Berlin (who also supplied the power plant), to the low condensing pressure used with this gas (generally 40 to 45 lbs. per square inch). Each of the compressors, two of which only are run in ordinary circumstances, one for the ice plant and the other for the cooling rooms, has a capacity of 48 tons refrigeration per 24 hours, and is fitted with silent acting valves. The three of them are connected direct to the condenser (our second unit), which is located above the engine-room, and is of the atmospheric or evaporative type. It is divided into two sections separately controlled.

Our third unit, the evaporator, which is connected to the suction of the compressors, just as the condenser is connected to the delivery, consists of coils of tubing, immersed in the large brine tank forming part of the ice plant. From this tank the cooled brine can be circulated as desired either by a propeller to the ice moulds or by a pump to the air cooler and the pipes in the smaller cold rooms.

The cooling of the main chill room is effected by a wet air cooler, illustrated in fig. 61. It consists of a number of shelves, with a receiving tank at the top, into which cold brine is pumped from the evaporator. The brine then trickles down over the shelves, and, being effectually broken up, offers a large cooling surface to the air passing through. The air itself, at about 39° Fahr., is sucked from the cold room into this chamber through the collecting ducts (seen on the ceiling in fig. 59), and is again distributed by suitable delivery ducts at about 27° Fahr., its temperature having been reduced by 12° Fahr. in the cooler. Similar ducts, it may be mentioned, are extended to the two hanging houses, and the whole system is controlled by a six-foot fan.

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Fairly cold weather is experienced in the winter at Offenbach, and, were the meat exposed to the temperature thus obtained while maturing, it would be frozen solid. Consequently a heating apparatus has had to be installed in the delivery duct just beyond the air-cooler to prevent this, the refrigerating plant being then shut down. It consists simply of a series of gilled pipes supplied with steam from the boilers.

The small horseflesh cooling-room and the pickle cellar are both cooled by gilled brine pipes which are led round the

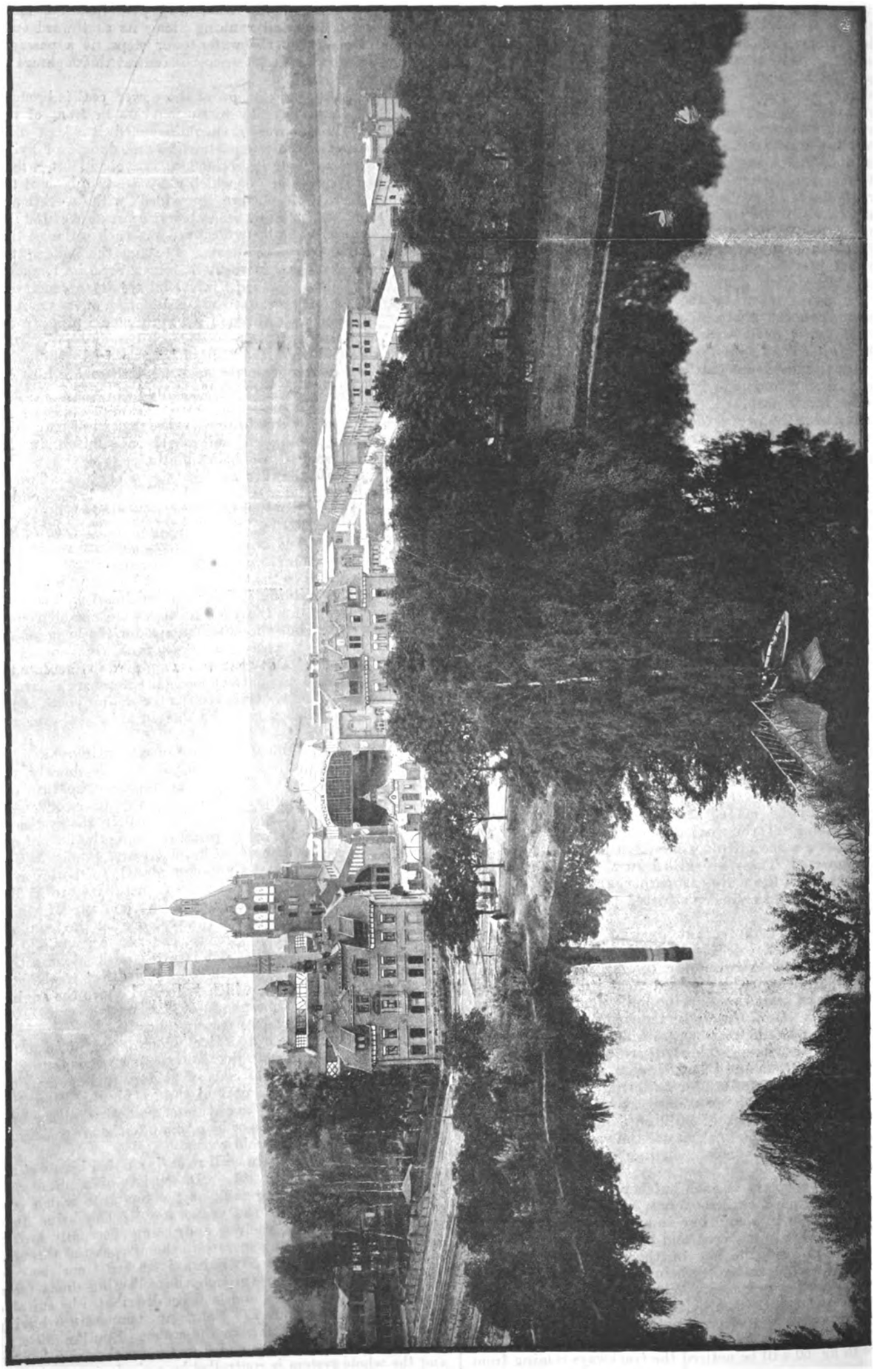


FIG. 56.—ABATTOIR AT OFFENBACH-ON-MAIN.

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sides and supplied with brine by the pump connected to the evaporator. An efficient air circulation is maintained by electrically driven fans, and to permit both the introduction of fresh-air supplies as required, and the expulsion of foul vapours, suitable openings have been provided.

in it 25 tons of ice in ½-cwt. blocks can be produced daily; also that by the aid of sundry accessories this ice is rendered transparent. It is sold to butchers and other consumers in the city, and is useful in helping to make the abattoir pay its way, or even show a profit. To remove the blocks, the

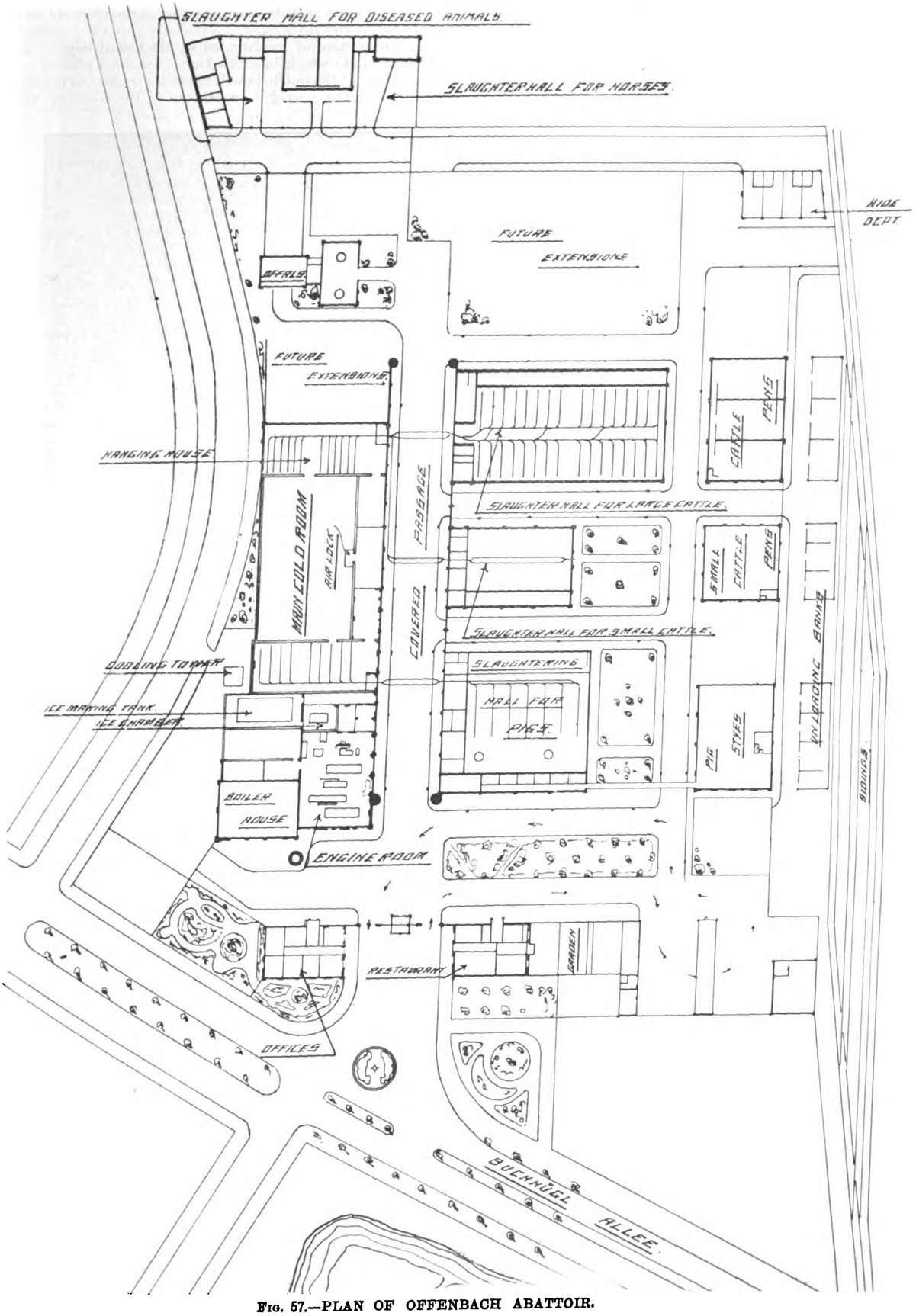


FIG. 57.—PLAN OF OFFENBACH ABATTOIR.

The only remaining portion of the cooling plant is the ice-making tank. The principle of this apparatus will be explained at a later stage, but at present suffice it to say that

passage already mentioned has been made, communicating direct to the covered way in which the delivery vans are drawn up, and should the supply exceed the demand an in-

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sulated chamber is available in which the ice can be stored. Naturally an abattoir of this class is expensive compared with one of the more ordinary type. The actual total cost was 101,500*l.*, of which the following are some of the principal items:—

Site	£6,650
Siding, with platforms	7,550
Power plant, refrigerating machinery, and ice tank complete	13,700
Chill and hanging room block, with insulation...	10,500
Building work, except the chill room block ...	45,550

In conclusion, it may be mentioned that the principal members of the staff live on the premises, accommodation being provided for them in the administrative buildings and above the restaurant.

The next important question for us to decide is the proportion which must exist between the size of the abattoir and the capacity of the chill room. Naturally this ratio cannot be fixed irrespective of locality, as so much will depend on the kind of trade which is carried on. In some places, for instance, some of the butchers will allow their meat to mature in cold storage for a week. In others, on the contrary, the

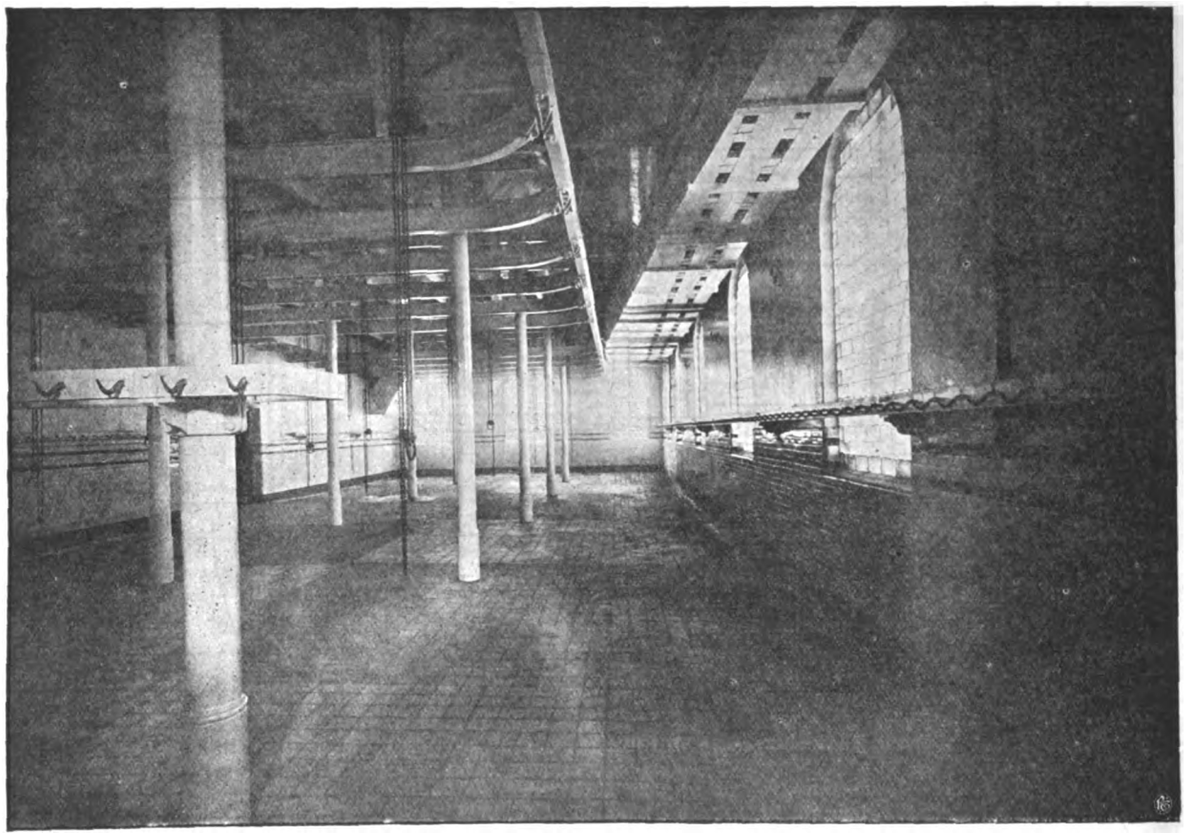


FIG. 58.—SOUTH HANGING HOUSE, OFFENBACH ABATTOIR.

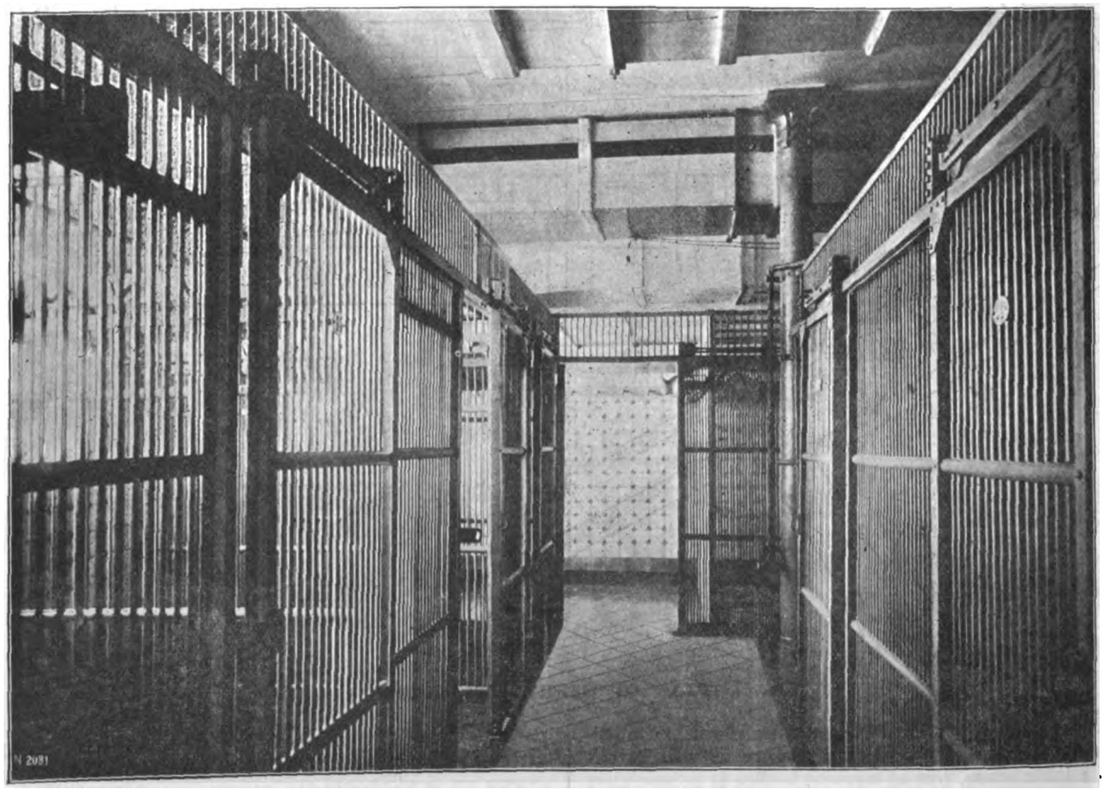


FIG. 59.—CUBICLES IN CHILL ROOM, OFFENBACH ABATTOIR.

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meat will be taken straight from the hanging-house to the vans. If the latter is the commoner practice it will, of course, be necessary to reduce the size of the cold rooms in proportion; while if the whole of the meat is to be matured for a week, the capacity must be increased accordingly.

To estimate this average value a very simple rule, which agrees well with ordinary practice both in this country and abroad, has been put forward by Dr. Schwarz, who is an eminent German authority on the subject. He allows for two killings per week, or, roughly, 100 killings per year.

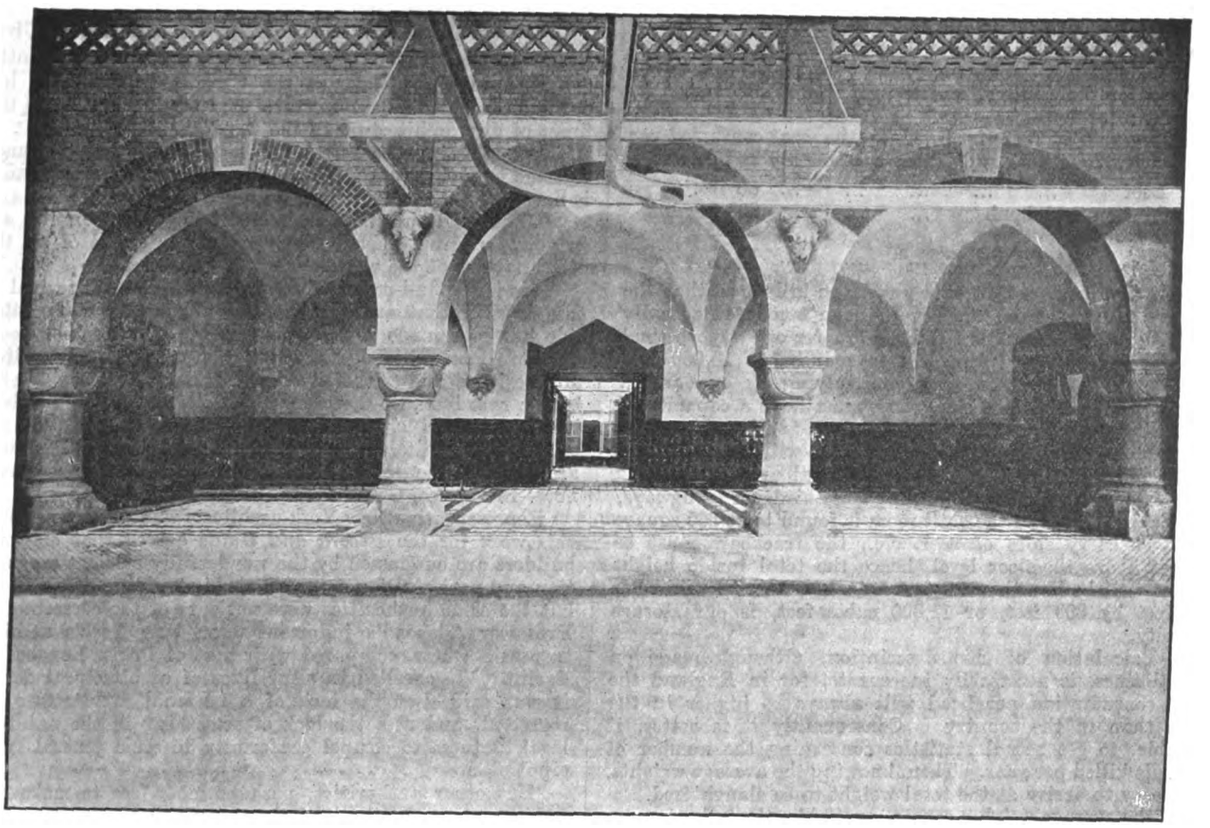


FIG. 60.—ENTRANCE TO CHILL ROOM, OFFENBACH ABATTOIR.

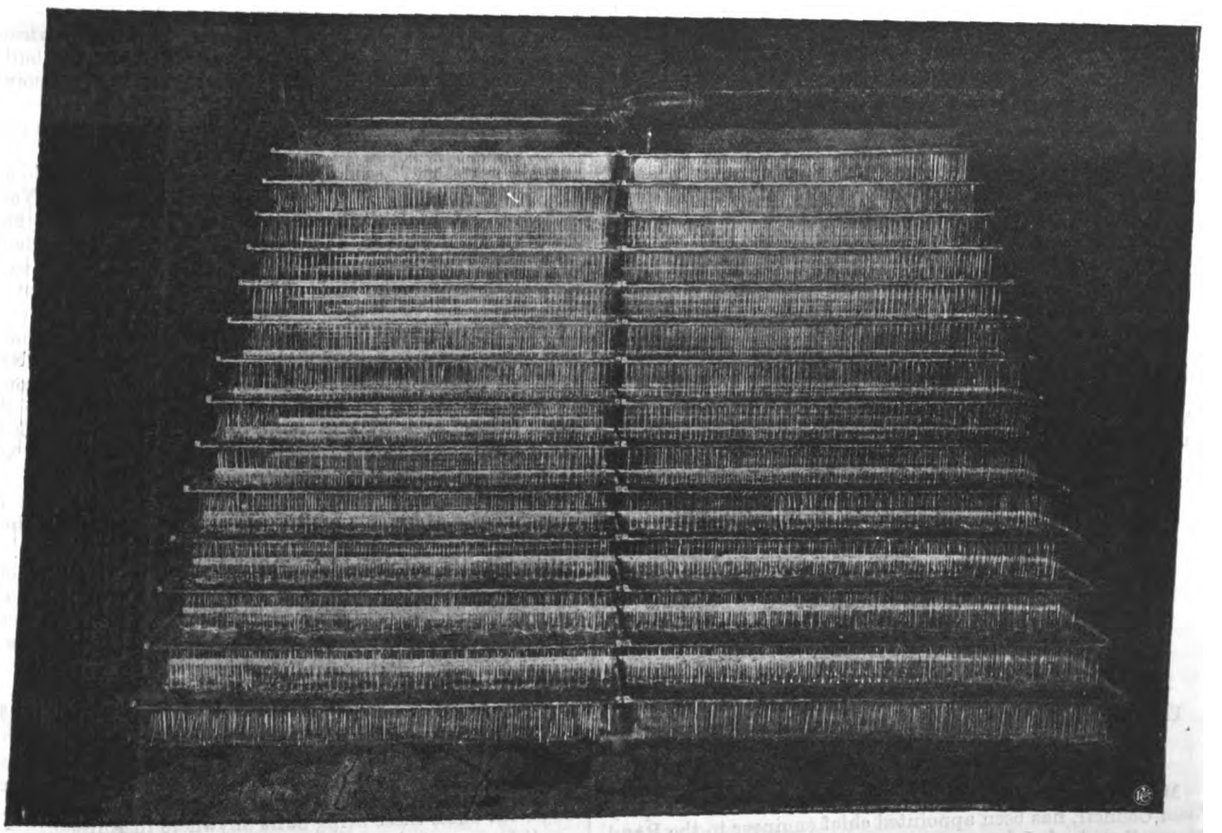


FIG. 61.—WET AIR-COOLER, OFFENBACH ABATTOIR.

Here, since there is so much variation, it will be better, we think, to make the calculations for average conditions. The exact bearing of either of the above factors on the proportion can then easily be assessed.

Taking, then, the statistics which give the yearly output in the past, he divides the total quantity by a hundred, thus obtaining the average weight or number of animals slaughtered per day. This number, he assumes, might all be

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put into the cold room for one day, and there might also be a quarter of the last day's killing left over. Accordingly the cold room must be large enough to accommodate one and a quarter times an average day's slaughter.

To take a concrete example, let it be assumed that a town of, say, 30,000 inhabitants decides to put in a municipal abattoir. The first thing to do is to find the yearly consumption. For this there will probably be some rough statistics available, but if not, we must take the consumption per head for the country, and assume that it holds good in this particular town.

In England, in 1909, for instance, the meat consumed per head, exclusive of pork and bacon, was roughly as follows:—

Beef	60 lbs.
Mutton and lamb	29 ,,
Total	89 ,,

Only 63.5 per cent. of this was home killed, so that the beef and mutton slaughtered in England amounted actually to 56.5 lbs. per person, or 1,695,000 lbs. for our hypothetical town. Taking 100 killings, this reduces to 16,950 lbs. slaughtered at one time, and multiplying by one and a quarter we find that the chill room must have a capacity of 21,200 lbs. In an abattoir plenty of room is allowed, and we therefore take it that 32 lbs. of meat only will be carried per square foot. This gives as the superficial area of hanging space 660 feet super, and adding one-third for gangways, &c., the gross area of the chill room is found to be 880 square feet. To carry sides of beef, &c., the trackbars must be 11 feet above the floor level, hence the total inside height cannot well be less than 12 feet 6 inches, and on this basis 12½ feet by 880 feet, or 11,000 cubic feet, is our storage capacity.

A calculation of this description, although made on liberal lines, is necessarily inaccurate, for in England the meat consumption per head will always be higher in the town than in the country. Consequently it is better, if possible, to get actual statistics concerning the number of animals killed per year. Then, knowing the average weights, it is easy to arrive at the total weight to be slaughtered.

If the average weights are not available, the following are fairly general, although subject to considerable variation in some districts:—

Beast (ox)	550 lbs.
Small cattle (sheep, calves, &c.) ...	60 lbs.
Pigs	180 lbs.

No mention, it will be noticed, has been made of the last-named animal in dealing with the average statistics. That is because figures will vary enormously in different towns, and because in most cases pigs are not slaughtered in abattoirs, but in bacon factories. Hence general calculations are useless, and it is necessary to have statistics.

Having determined the storage capacity of the chill room, it is an easy matter to calculate the size of the freezing machine along the lines already laid down in a former article. For this purpose it should be assumed that all the meat from one day's killing will be cooled down during that day, or that at least the cooling will extend into only a small portion of the next day. Allowance should also be made for cooling the hanging houses, if this is done artificially.

As a rough guide the following figures, connecting storage capacities with refrigerating tonnage, will serve:—

Cubic Feet.	Tons Refrigeration per 24 Hours.
2,000	2.2
5,000	5.5
10,000	10.0
15,000	13.2
20,000	16.8
25,000	19.5
30,000	22.0
40,000	27.0
50,000	31.0

The maturing temperature is taken at 35° Fahr.

(To be continued.)

MR. W. INGHAM, formerly water engineer to Torquay Town Council, has been appointed chief engineer to the Rand Water Board of Johannesburg, which has control of seven municipalities on the Reef and Rand mines. The district supplied covers 365 square miles, with a population of 365,442. The commencing salary is 2,000*l.* a year. Mr. Ingham enters upon his new duties in November.

ARCHITECTURE IN NEW YORK AND FOREIGN CITIES.

WE reprint from *Record and Guide* (New York) the dicta of Professor Adshead on the architecture of New York, and the professional comment thereon of some leading architects of the United States:—

Professor Adshead, head of the Department of Civic Design in the University of Liverpool, in a speech recently delivered in New York, at the City Hall, expressed his opinion that "the architecture of New York city is the finest of any architecture in the world."

He further remarked that, unlike England, Germany and, to some extent, France, New York in its street architecture is never trivial; everything is on a grand scale.

"Your tall buildings are a credit to your ingenuity, and in your building construction you are far ahead of all the other nations of the world."

This is the first occasion since the architectural revival in this country that an architect of eminence from the other side has ever made a comparison between contemporaneous work in America and other countries, so comprehensive, direct and positive, and to the advantage of our architects. It has been a rare instance when an architect from abroad has been intellectually able to draw a line between the present and the past in architecture and to compare the work of American architects of the present day with what is being done abroad now—in France, Germany and the British Isles.

Representative New York architects who were interviewed this week for the *Record and Guide* agreed that old-world builders are outclassed by the wonderfully efficient organisation and powerful financing of our big building corporations, but the same authorities were not sure of the correctness of Professor Adshead's judgment upon New York's architecture as a whole, compared with that of Paris, London and Berlin. We excelled in some lines of architectural design, it was said, but the lack of a national architecture was regretted, and also the lack of something in the nature of legal statutes to compel conformity to some general municipal plan.

But other authorities, perhaps more free to make comparisons, were emphatic that the work that is being done in New York at the present time, in architectural design as well as in construction, is superior to contemporaneous work abroad.

Clarence True, the architect, who originated the American basement house, and who during a long career has built hundreds of dwellings in New York, illustrated this point in a story he related of a visit to York Cathedral in England. He met in the city of York a Scotchman, with whom he had a very plain discussion on this subject.

"He asked me," said Mr. True, in telling of the incident this week, "if we had anything in America like York Cathedral. I replied that I could not see how that had anything to do with it, as my family did not leave England until 1634, and consequently we had as much to do with York Cathedral as he had, it having been completed before that era.

"Then I asked him to show me what they were doing now. And I advised him that when he should come to New York not to look for ancient things, as all Americans would naturally do when visiting Britain, but to ask to see the latest things, and then he would see something worth while.

"What Professor Adshead says is so," continued Mr. True. "Europeans are beginning to find out that the 'American experiment' is a fact, and consequently the intelligent man is looking for help from us, the same as we have looked for benefits from them. New York now is architecturally in its infancy, but foundations are being laid here for an architecture which, when the city grows up and is half as old as either London or Paris, will far surpass theirs.

"London, Paris, Berlin and all the largest cities of Europe have, of course, an advantage over New York in that they are governmental and financial capitals combined, the same as if New York and Washington were one city. The architecture of London and the architecture of Paris have an historical interest which New York's does not possess, but in character and workmanship the buildings now being constructed in New York, irrespective of Governmental buildings, far excel those being built anywhere in Europe.

"It seems to be a fad to belittle New York. I notice this particularly in the reports of the Tenement House Commission, where on one occasion the worst tenement on Cherry Hill was shown in comparison with the best thing done in Berlin. They have in Berlin nothing like the 'Apthorpe' or the two miles of elegant 'tenement houses' on Central

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Park West, or apartments like those on Riverside Drive or on Washington Heights.

"New York is far from being perfect, and we all know ways in which it can be improved, but when it comes to a comparison of modern work Professor Adshead has told the truth. Take his own city, Liverpool, which is comparatively modern and of the same age as Boston, and Boston can learn nothing from Liverpool either in architecture or construction. And this being true of Boston, what of New York?"

Henry J. Hardenbergh during the thirty years that he has been in active practice has been recognised as one of the masters of his profession. A long list of notable buildings stands to his credit. In the eighties he was building such masterpieces as the "Dakota" apartment house on Central Park West, which was an inspiration for the building and real estate fraternity for years afterward. In the nineties he was building the Waldorf-Astoria and such, and altogether Henry J. Hardenbergh is responsible for much of the good architecture in this country that Professor Adshead has ranked first in the world. Perhaps this is the reason why Mr. Hardenbergh was found not prepared at the moment to give an extended answer to the *Record and Guide's* question as to whether he considered the judgment of the English architect entirely just to his colleagues at home and on the Continent. But his thought was indicated when he answered:—

"Professor Adshead is perhaps right and perhaps wrong, according to the point of view. I would not care to say in a general way just whether he is right or wrong."

The members of the firm of Clinton & Russell, architects of the Hudson Terminal Buildings and many other great office buildings, the Hotel Astor, the Knickerbocker and the Plaza, and who, in a word, make the designs for a large share of all the big work done in New York, were found to be of the opinion that Professor Adshead had given New York architects more than their just due, at least in some particulars.

They agreed that, while our tall office buildings are superior in construction and general adaptability of design to anything of the kind in the world, such buildings are very rare in other parts of the world; comparison was therefore irrelevant.

As to other kinds of buildings, those in the large cities of Europe were, in their opinion, equal in general convenience and superior in beauty of design to ours, though we excel in mechanical equipment, grade for grade or class for class.

They considered that our apartment houses and hotels provide more conveniences than those of Europe, "but generally European monumental work is ahead of ours, though we are catching up rapidly."

Representative of the younger architects of national prominence, Mr. William O. Ludlow, of Ludlow & Peabody, was also inclined to think that Professor Adshead's judgment of New York architecture should be taken with some reservation. Mr. Charles S. Peabody, of this firm, sustained a severe injury on Monday of this week, at the Lake George Country Club, by falling from a ladder upon his head, and for a time his life was despaired of. Notable works upon which the firm are now engaged are the Fort William Henry Hotel at Lake George, the Hotel Champlain at Plattsburgh, and the new buildings for the University of Georgia. Before the late New York Building Code Commission Mr. Ludlow advocated limitation of the height of buildings.

"If Professor Adshead had said that New York possessed the finest architecture of its kind in the world, his statement would have been eminently indisputable," remarked Mr. Ludlow, when asked for his opinion upon the relative standing of New York architecture.

"My own impression is, however, that the Professor had in mind something other than the façade architecture of New York. I imagine that he was considering our buildings as the creation of the architect as master builder, and indeed in daring construction, ingenuity of plan and adaptation to complex conditions our buildings are without parallel.

"From this point of view, perhaps, New York can boast the finest architecture in the world."

Mr. Charles H. Israels, of the firm of Israels & Harder, architects, who has been prominently identified with the work of the architectural and art societies for the maintenance in this city of a high standard in architecture and construction, and who was a member of one of the recent boards appointed to revise the New York Building Code, was also asked if the remarks of Professor Adshead in his address at the New York City Hall had surprised him. Said Mr. Israels:—

"I believe that the average commercial building in New York city is better than its counterpart in the great European cities when considered as a single building. The thing that New York lacks, however, is a comprehensive building regulation to compel a certain uniformity which is necessary to a satisfying total result.

"We also suffer from the lack of a national style," continued Mr. Israels, "which in turn is responsible for the glaring contrasts that have been so frequently criticised. But most of all we lack a comprehensive city plan.

"Our city has few vistas. We have comparatively few sites where monumental buildings may be placed, and even though the individual examples of our city architecture may be excellent, the total result is not by any means as satisfactory as that presented by the average European city."

Mr. Eli Benedict, of 1947 Broadway, well known in his profession as an instructor and critic as well as a practitioner, was also found to be of the opinion that Professor Adshead's remarks should be taken in a somewhat restricted sense.

There was no question, Mr. Benedict said, but that in the handling of our peculiar problems, such as our tall office buildings and the better class of our hotels and apartment houses, we have created many original and beautiful examples of modern architecture that no other city can duplicate. He also thought that the average work of our best architects is fully up to, if not superior to, the work of the best architects of any old-world city. He added:—

"Then, from the builder's point of view, we are undoubtedly using the best of materials in a skilful and substantial manner, and are erecting with wonderful rapidity huge structures which are the wonder of the day in the eyes of old-world builders who are wholly out of class with us in this respect. This is due to the wonderfully efficient organisation and powerful financing of our big building corporations."

Mr. Charles Buek, architect, builder and member of the Board of Examiners of the New York Building Department, said he was afraid that Professor Adshead had been trying to make us feel good, and that if he really tried he could find some of our architecture that is occasionally "trivial." But Professor Adshead was right in saying that our building construction, in the engineering sense, is ahead of that of all other nations, certainly so far as our large residential and business structures are concerned.

The beauty of a city architecturally was largely a matter of taste upon which men will differ, and also a matter of habit and association, continued Mr. Buek. Our architecture, in his view, was more vigorous, more original, not so much confined by rule and precept, and our fine business streets were accordingly more varied and interesting than those of European capitals. To a New Yorker the streets of Paris, Berlin and Vienna, built under strict regulations as to size and height, looked monotonous and too uniform. To the European accustomed to this uniformity our streets appeared irregular and too full of violent contrast. Mr. Buek then said:—

"The finest architecture of London is spoiled by the unsightly stains and discolorations due to the climate.

"The European architect in his embellishment and details rarely ventures to depart from the well-settled traditional forms of the art.

"The American is freer, bolder, and in our best modern work, I think, superior, and is more successful in adapting form and design to new materials and methods. Take it all in all, our best to-day will bear comparison with the best of modern Europe."

Mr. George B. Ford thus expresses his views on Professor Adshead's dicta:—

As one who had the pleasure of accompanying Professor S. D. Adshead on most of his trips in and about Manhattan, I believe that I can say something further about his views that may be of interest.

In the first place, he was not "jollying" us. He was quite sincere, believing all that he said about us in his City Hall speech. Long before he came to America he was well acquainted with our architecture, and was so impressed with it that he felt that it was just as necessary for him to see it as it was to see the architecture of France or Italy.

Coming here, he found the actuality quite exceeded his expectations. The three things that impressed him most were the clearness and softness and beauty of colour of our atmosphere, the width of our city streets and the big, simple effect of the architecture which bordered them.

He rarely found here that broken-up effect, that triviality, that frittering away into petty and meaningless details, that one meets at every turn in London. The general run of build-

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ings here seemed to him to have a dignity not approached by those in any foreign country, even France.

The beauty and variety of our building materials with the resultant colour and texture that they give to our architecture was a constant source of delight to him, and it was largely due to this that he found our miles and miles of six-storey apartment houses interesting.

He believes that the future of our architecture here is dependent on our keeping to the Classic and Italian Renaissance for our inspiration. Our "Secession" architecture seems to him to be leading us astray.

The buildings that most appealed to him were Columbia Library, the U. of P. Museum, the Gorham Building, the Metropolitan Tower, Dr. Parkhurst's Church, the Morgan Library, &c.

He has preached American architecture so long in England that he has been called there an American maniac. At first he was almost alone, but to-day among the rising generation of English architects there is not only a rapidly growing appreciation of our work, but a tendency to draw inspiration for their own designing from it.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Legal Query.—Claim to Land.

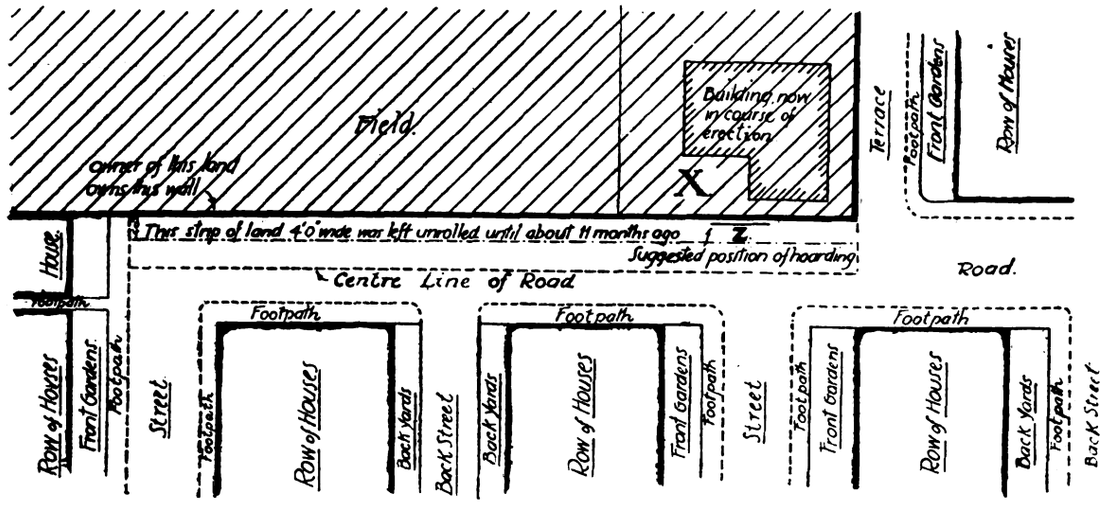
SIR,—Mr. A., a builder, purchased land shown on plan about forty-eight years ago, right up to the boundary wall round field (shown by hatched lines), but not including this wall. When the Builder A. sold the respective houses as he built them, the buyers, of course, in each case purchased half the road. Therefore, being no houses erected on the field (shown hatched), Builder A. referred to above naturally expected that he still owned the strip of land up to the wall from the centre of the road, as shown by dotted lines, and that anyone building on field (hatched) would have to purchase this strip of land opposite their site in each case. Now a person has purchased a site marked X on field (hatched), and has commenced to build. Can a hoarding be erected immediately in front of this wall on Builder A.'s strip of land in position marked Z, and so stop the light and access to the new buildings from this side, which no doubt would compel them to purchase their respective portion of this land? The facts below exist in connection with this road:—

About fifteen years ago the Whitby Urban District Council posted bills in these roads or streets stating they were taking over these roads or streets, if no objection. Owner A., builder referred to above, verbally objected to it, and would not have this strip of land rolled right up to the wall, with the result it was not done, a strip of land 4 feet wide being left unrolled from the side of the wall. I may also add that the then owner of field (hatched) paid Builder A., owner of this strip of land referred to, an acknowledgment of 1s. per annum to cross over this strip of land to get over this wall for near access to his residence from this district, which acknowledgment was actually continued to be paid after the Whitby Council had posted these bills supposed to be taking over these roads. If the Whitby Council claimed control over this road, is it not very strange they never rolled same up to this wall, as it was simply left like a heap of clay for years and was left untouched each time the road was rolled? Twelve years ago Builder A. died, leaving his property to his grandsons, but still this part or strip of the road was left in the same state until about eleven months ago, when the Whitby Council rolled it under verbal protest from the executor. Now that a building has been commenced do you consider that Builder A.'s grandsons, to whom all his property was left, still own this strip of land or road, and would they be in the right in erecting a hoarding up to the wall on this strip of land and thereby compel the party now building to purchase? The old residents of this district along with certain members of the old Council are perfectly aware that Builder A. always claimed this land; in fact, I have played quoits on this land myself.

Whitby: September 13, 1910. IVY.

Reply.

Claim to Land (Ivy, Whitby).—From your letter it is doubtful whether there is any evidence to-day that the owner, A., the builder, made any objection to the public notice of the District Council that they intended taking over the road. Any objection would have to be made in accordance with the terms of the notice, and the verbal objection which you say was given might therefore have been invalid, and would not now be easily proved even if valid at the time. The protest against the rolling of the strip of land was also unfortunately only verbal. The fact that an adjoining owner paid A., the builder, a small sum annually for permission to cross is no proof that the Council had not taken over the road. The true legal position of your case can only be ascertained after reading the notice posted up about fifteen years ago by the Council. If you intend to act you must do so promptly before the new builder incurs much expense. Of course, a hoarding put up in the way you suggest would be a claim on your part, but it would be well for you to give reasonable notice both to the Council and to the new builder before doing so.



THE London Master Builders' Association held a council meeting on the 15th inst. Reference was made to the occupancy of the new offices at Koh-i-Noor House, Kingsway, W.C., which takes place on Friday, the 23rd inst., and to which address it is requested that all communications be sent. The future publication and circulation of the Association Diary and Handbook were considered, and instructions were given to make it as useful as possible not only to builders, but also to architects, as the latter now have copies posted to them. The L.C.C. submitted the draft of its suggested building regulations regarding reinforced concrete construction for suggestions and criticism. The matter was referred to a committee of the whole council for consideration and report at an early date. The action of the L.C.C. in drawing up regulations for this work was warmly welcomed, as it was felt that the carrying out of same would be performed by builders apart from the designing.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, October 1.

Manchester Society of Architects : Visit to Leeds.

Monday, October 3.

Society of Engineers : Paper on "Current Professional Topics," by Mr. Henry C. Adams, A.M.Inst.C.E., etc., at Caxton Hall, 7.30 P.M.

Tuesday, October 4.

Royal Archæological Institute : Autumn Meeting at Westminster Abbey; two days.

Thursday, October 6.

University College, Gower Street, London (School of Architecture) : Mr. H. V. Lanchester, F.R.I.B.A., begins a course of three lectures on town planning, 6. (1) Ideals of the Past.

Monday, October 10.

Royal Institute of British Architects : Town Planning Conference; October 10-15.

Architectural Association : Annual General Meeting. President's address and distribution of prizes.

ECCLESIASTICAL ART EXHIBITION AT CAMBRIDGE.

IN connection with the Jubilee meeting of the Church Congress, which has been held at Cambridge during the present week, there has been brought together a very interesting exhibition of ecclesiastical art, especially rich in Communion plate belonging to churches in the diocese of Ely. Unfortunately the catalogue, which contains a list of 1,109 exhibits, seems to have been compiled simply as a record of the loans by particular churches or individuals, whilst the objects themselves are displayed with a view to making the show look pretty, and in no sort of sequence or order, save where a particular collection is comprised in one case. Hence, to find any single specimen is, as we heard one exasperated lady visitor say, like looking for a needle in a bundle of hay.

First in the catalogue come the pastoral staff belonging to the See of Ely and that which is the personal property of the Bishop. The former has a well-designed carved ivory crook enclosing a lamb and flag, and the ebony staff is mounted in silver-gilt studded with gems. The Bishop's personal staff has a silver crook and is mounted in silver. The Mayor and Corporation of Cambridge have lent their six maces and other Corporation property, including the Mayor's chain and badge. The Great Mace is of silver-gilt, measures 52½ inches in length, was made in the reign of Queen ANNE and presented to the Corporation in 1710 by SAMUEL SHEPHEARD, JUNR., Esq., M.P., of Exning, one of the members of Parliament for the borough. The four smaller maces, made in the reign of GEORGE I., are of similar design, each 42 inches long, of silver-gilt, and were presented to the Corporation in 1724 by THOMAS BACON, Esq., M.P. Most interesting is the small Sergeant's Mace used in the reign of CHARLES I. This is of copper-gilt, and is about 10 inches in length. The Town Clerk, J. E. L. WHITEHEAD, Esq., M.A., also lends some plate of eighteenth-century date that has been presented at various times or has belonged to the Corporation.

The Communion plate that is exhibited is naturally for the most part of post-Reformation date, and it is very interesting to note the various forms that have been in vogue, and particularly the very obvious intention in most cases to prevent a "Communion cup" from looking like a chalice.

As an example of the loss of grace that came from the avoidance of the older type, there is exhibited a beautiful chalice, lent by the Rev. ROBERT DIXON HOPE, Vicar of Old Hutton, Kendal, which, says the catalogue, is the only example of mediæval plate extant in the diocese of Carlisle. This pre-Reformation chalice is unmarked, but evidently, from its close resemblance to the well-known Nettlecombe chalice, may be assigned to *circa* 1459.

The chalice form of bowl appears, however, occasionally in both seventeenth and eighteenth-century Communion cups, as in the beautiful example from Pickwell Church, Leicestershire, dated 1602; the early seventeenth-century cup from St. Benet's Church, Cambridge; and that belonging to Longstowe Church, Cambridgeshire, dated 1780. A silver-gilt chalice with pierced foot and holder of Spanish design, bearing the Dublin hall-mark of 1716, and lent by HUBERT DYNES ELLIS, Esq., can perhaps scarcely be fairly quoted as post-Reformation, as it was probably made for Catholic use. The example from Giggleswick-in-Craven, Yorkshire, which is inscribed "Giggleswick Communion cup, 1731," bears the assay-mark of 1652, and shows the bell shape that was a sort of compromise between the chalice form and the trumpet-mouthed shape. An early example of the expanding lip is the cup belonging to Godmanchester Church, Huntingdonshire, dated 1559, which has a conical cup on a stem which becomes bulbous just above the foot, which is expanded. The knop is represented by a flange, which projects just below the bowl. There is reed ornament on the stem and egg-and-tongue ornament on the foot.

A veritable cup, but of good design, comes from the church of St. Andrew the Great, Cambridge, dated 1569, and inscribed "THIS×FOR×SENT×TANDROS×PARES×IN×KAMBREGE"—a curious example of the laxity of spelling so common in past times, when even proper names were frequently given in various forms in the same document.

Of the bell-shaped cup with expanding lip there are several examples, some short and squat, some long and deep, mostly plain, but some engraved, especially in the Elizabethan period. Of exceptional form is the cup from Papworth St. Agnes, Cambridgeshire, which has a bowl of cocoanut shape, suggested probably by the cocoanut-shell cups that came here in the days of the East India Company. Another curiosity is the cup from Wraxall, Dorchester—a remarkable example, quite unlike any other in Dorset or Wilts. It bears a maker's mark which resembles one found on plate from 1615 to 1629, which may perhaps be the date of this cup. The design with which both bowl and stem are ornamented is founded on the daisy. Each part has two tiers of petals, plain and granulated, counter-changed. The same idea is carried out on the under-side of the bowl, in a ring of punch-marks like daisies.

Lent by the Rev. A. J. HEELIS, M.A., Brougham Rectory, Penrith, is the so-called "Bird Cup," which is clearly of German design. It bears two marks—(1) Roman capital "N" in circle: Nuremberg town-mark; (2)

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maker's monogram, "P.S." or "S.P." in an oval inscription, close to the rim, in two lines:—"Ex dono JACOBI BIRD in usum sacro sanctæ Eucharistiæ in Ecclesia Sancti WILFRIDI DE BROUGHAM vulgariter appellata Nine Kirkes in comitatu Westmerlandiæ." JAMES BIRD was steward to ANNE, Countess Dowager of PEMBROKE.

A very beautiful little cup is lent from Waterbeach Church, Cambridgeshire, date 1557, a cup of tazza form with *repoussé* ornament of dolphins' heads in relief.

Amongst the patens exhibited there are some of pre-Reformation date. Thus from Parson Drove Church, Wisbech, Cambridgeshire, comes a silver paten of about 1500 A.D., but without hall-marks. This is said in the catalogue to be the only untouched piece of pre-Reformation church plate in the county. It has a sexfoil depression, and in the centre is a vernicle surrounded by a circular riband in which are a number of short rays. The head in the vernicle, surrounded by a crossed nimbus, is full-faced with a forked beard, the hair of the head falling straight on the shoulders. Another paten of fifteenth-century date is lent from Farcet Church, Huntingdonshire. This is parcel-gilt, and, like the Parson Drove example, has a sexfoil depression. The central ornament here is the sacred monogram I.H.S. The oldest paten known having the mark of the London assay is that from Stow-Longa Church, Huntingdonshire, dated 1491, and closely resembles the one from Parson Drove in its form and in the central vernicle.

The earliest paten exhibited, and that for the first time, has been lent from Bredhurst Church, Kent. It is of copper, formerly gilt. Only four others of similar type are known, and each was found in the grave of an archbishop or bishop. These are at Chichester Cathedral, Lincoln Minster (1235-53), Worcester Cathedral (1237-66), and York Minster.

Of post-Reformation patens and alms-dishes there are many good examples, a very fine alms-dish being that from Holy Trinity Church, Cambridge, date 1632.

There are several instances of secular plate devoted to church use, as the silver dish used as a paten belonging to St. Martin's Church, Laugharne, Carmarthenshire. It is of the Cromwellian period, bearing hall-mark of 1650 and a maker's mark found only here and at Ferryside. In the centre are the initials of WILLIAM THOMAS and BLANCHE his wife. WILLIAM THOMAS was vicar of Laugharne (ejected in 1644 and restored in 1660) and afterwards Bishop of St. Davids and Worcester. From Litlington Church, Cambridgeshire, comes a silver porringer, used as a Communion cup, and dated 1677. A porringer and cover of the Commonwealth period are in use as chalice and paten at Acle Church, Norfolk. The porringer is inscribed "Acle Saynt Edmund, 1660."

Pewter plate are lent from Ranworth Church, Norfolk, from Stanground Church, Huntingdonshire, and other churches.

An unusually perfect example of a processional cross, date probably *circa* 1470-80, recently given to Lamport Church, Northamptonshire, is exhibited. This is of gilt-latten, and has the figures of St. Mary and St. John on stems branching from the crucifix. Another pre-Reformation processional and altar cross of about the same date comes from St. Donat's Church, Llantwit Major, and is a fine piece of craftsmanship.

The Cambridge University Museum of Archæology and of Ethnology has lent a number of interesting exhibits, fragments of mediæval alabaster work from churches in the neighbourhood of Cambridge, Whittlesford, Milton, and Hockington; also a series of fifteen bronze crucifix figures, ranging in date from the eleventh to the late eighteenth centuries, besides many other mediæval objects.

Mr. H. D. ELLIS has lent a collection of several pieces of church plate, including two mazer bowls, and the Rev. Dr. MORGAN, Master of Jesus College, a case of excellent bronzes, chiefly of Italian workmanship.

Brasses are well represented by an exhibit of some of those in the diocese of Ely, lent by the Monumental Brass Society, and Mr. HENRY E. FRANKS has lent a series of some of the most notable brasses of Southern England, from that of Sir JOHN DAUBERNON onwards.

Several good examples of ecclesiastical vestments and other needlework are shown, including the Ely cope and other mediæval work.

THE ROYAL SANITARY INSTITUTE CONGRESS AT BRIGHTON.—III.

THE design of hospitals did not bulk largely in the proceedings of the Congress. Mr. A. SAXON SNELL contributed a short essay entitled "Some Notes on Fever Hospitals," from which we take the following extracts:—

A general hospital may be considered as an institution for obtaining the best skilled treatment and nursing at the *minimum* of cost. A fever hospital is more than that. It is also a house of detention for and destruction of infectious disease germs, though how far it succeeds in these directions appears to be a debateable matter. It follows that several precautions, buildings and fittings are required which are unnecessary in a general hospital.

Fever hospitals, as generally built, are expensive erections. The cubic space per bed is double that required in a general hospital, and the area of land is even greater in proportion. A general hospital may be built within the confines of a town; a fever hospital must be isolated in open country. Yet again, different institutions, or at least different ward blocks, must be provided for different diseases. What this may mean in the way of buildings and engineering equipment is obvious.

If all these precautions and their great cost brought phenomenal success we might leave well alone; but a perusal of hospital reports scarcely gives the impression, although very great improvement has taken place in the last ten or fifteen years.

Such considerations lead us from time to time to seek even better methods, and particularly such as will lessen the great cost.

Now, as to hospital buildings (with which, of course, I am more immediately concerned), it has been sought to reduce the cost by constructing them of light and cheap materials—generally timber framing lined with boarding and galvanised iron; and this method has been advocated also on the ground that all fever hospitals ought to be pulled down and burnt within a limited number of years. They are, however, wasteful of heat, require great expense in repair and upkeep, and it must be added that the moral courage required to scrap them periodically is often wanting. Moreover, they are necessarily crowded with dust and germ-holding corners, angles and hidden spaces.

There are, however, modern methods of erection not open to these objections, and it has always appeared to me that excellent buildings at comparatively small cost could be obtained with steel framing filled in with light concrete construction. The walls might be formed with two thin slabs fixed so as to cover the steelwork, and with a small air-space between them which would help to keep the building wind and weather tight and reasonably warm. They would be finished inside and out with hard plaster. The floors would be formed with concrete laid between steel joists and covered with one or other of the many patent compositions in the market, which are both impervious and cheap. The ceilings would be formed in the same manner as the walls.

With such a method of construction it is easy to obtain those flat and even surfaces, unbroken by unnecessary and dust-collecting ledges and angles which are to be avoided at all costs in fever wards. The windows would be steel casements, and the doors might with advantage be framed with steel and sheet iron.

Periodically the concrete filling and surface finishings might be removed and reinstated with new material. The steel framework would require washing only.

Such buildings, or rather the framework, could be taken down with comparative ease and at small expense for re-erection on a different site if required; and their cost, although greater than ordinary wood-framed constructions, would be far less than for permanent brick and stone buildings.

It would be unnecessary—indeed, undesirable—to build the administrative and staff quarters in this manner, as there is no special reason for housing the officers and servants otherwise than in the manner usual in ordinary hospitals. These should certainly be designed as permanent structures and with due regard to comfort and pleasure.

It is possible to go much further in this direction, and radical spirits have advocated doing away with buildings

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altogether for housing fever cases and substituting tents. The great point (apart from the question of cost) seems to be that the patients lie practically in the open air.

The thing has been done many times since, and always with marvellous results. There are, of course, drawbacks, but the benefits surely outweigh these many times over. Indeed, in the light of experience in this direction it is difficult to understand why, in any case in the summer months, they are not more extensively used. What can and has been done under emergencies with the simplest materials and covering was very graphically described nearly forty years ago by Dr. Guy ("Public Health," by W. A. Guy, M.B., F.R.S. London, 1874. Pp. 312-317).

The second point I would refer to is the liability of fever hospitals to become a source of infection to the surrounding area. There was an interesting discussion at the sessional meeting at Newcastle in 1905 upon whether the germs of disease could be carried by air currents to any appreciable distance, but it does not seem to have been proved conclusively; and this would seem to have been the result also of Mr. Powers's researches many years ago.

The Local Government Board, taking as always the middle line of safety, insists that in case of small-pox hospitals this contingency should be taken into account. For other infectious diseases it prescribes a zone of 40 feet only round the ward blocks.

The third point to which I would refer is a method of reducing the number of separate blocks for different diseases and obviating the necessity of placing more than one disease in a ward. The Pasteur Hospital in Paris is a practical experiment in this direction.

Mr. SNELL illustrated the application of the principles he enunciated in a design of his own, in which each ward block is divided into separate rooms, each for one patient, on either side of a corridor open to the air at each end. The internal walls of these rooms, Mr. SNELL proposed, should be of plate-glass, fixed in light steel frames, the glass being obscured to a height of thirty inches. Each room would be separately ventilated and heated. This idea of isolated rooms is now being carried out at the new King's College Hospital by Mr. WILLIAM A. PITE, for the twenty-four hour observation-wards.

Papers on "Municipal Sanatoria for Phthisis" were furnished by Dr. DUNCAN FORBES, Medical Officer of Health for Brighton, and by Dr. JOHN R. STEINHAEUSER, Medical Officer of Health for Lewes, both of which advocated strongly the establishment of such institutions, and, dealing chiefly with financial and administrative points, did not contain much information for architects, save that commendation was given to the low cost of the Benenden Sanatorium, Kent.

Mr. JOHN DARCH presented a paper on "The Eye as it Affects Practical Illumination," in which he defined the conditions essential to good artificial illumination as (*a*) a sufficiency of light, (*b*) perfect steadiness, (*c*) effective diffusion and freedom from violent contrasts, (*d*) a downward direction, preferably oblique, (*e*) the colour to be as white as possible; and he offered the following practical suggestions:—

The purpose and object of artificial lighting is to make properly visible the things required to be seen. This really covers the whole case, but may be interpreted in the following rules:—

1. The lamps or other sources of light should be so arranged that they are not visible from the more frequented or ordinary points of view.

2. The illumination should be sufficient to cause the objects to appeal at once to the eye, but should be free from glare.

3. For general illumination the light should have a preponderating downward direction, freely flooding ceilings and walls, uniformly distributed and fully diffused.

4. Special work at desks, benches, &c., should have special lighting, adjustable in position and power, with opaque shades.

5. The colour of the light should be as pure and white as possible. Monochromatic light should, as a rule, be avoided.

The stages of our theatres are about the only places that are always well illuminated; the scenery and the lighting are each the complement of the other, with the most natural and agreeable results. Now, if architecture has any power to charm, that power can only take effect when it is subjected to suitable lighting. It is curious that this truism is so completely overlooked, as one may see in any public building, sacred or secular. The architects of ancient Rome well knew that it was upon the lights and shadows that their superb art depended.

With regard to the disputed question of Direct *v.* Indirect lighting: always prefer direct lighting in so far as it will accord with the above rules; indirect lighting where specially suitable or inevitable; and for the rest, an arrangement of limited obscuration of lights which combines the advantages of the other two.

From the fact that a shop front is viewed from one side only, it becomes a simple and easy matter to properly illuminate it. The business instinct has already grasped the fact that money thus spent is a good investment, for improvements have already taken place in many shop fronts; but the majority are really not illuminated, they are simply invested with obtrusive lights that advertise themselves rather than the goods. I would add that the practice of placing glaring high-power lamps in the front of shops is especially foolish and dangerous. The City authorities of London issued a regulation a short time since that all shop lights be screened on the outside, but they appear to be slow in enforcing it. The methods of shop lighting are largely responsible for the character and elegance of our streets.

The lighting of the average church has, perhaps, more than any other class of building, transgressed the most elementary principles of good lighting. To see anything at all the worshippers have to peer through a forest of low-placed lights, or, at least to endure the glare of a couple of pulpit lights; and yet in many of our leading churches there is not enough light to read by. One would suppose that the beautiful decorations of a church are placed there to be seen, but in nearly every case, at least at night, the upper two-thirds are lost in gloom, and the lower third consists of a few dazzling points of light that obscure all behind them. A chancel may be effectively lit by means of lights behind the chancel arch or other projections: one may instance the sublime effect thus produced in the Guards' Chapel, St. James's Park. Such lighting is restful and soothing, and much more conducive to worship than the mystic gloom (always accompanied by the irritating points of light) which several architects have recently defended on religious grounds.

Concert and lecture halls are, as a rule, little better illuminated than churches. Bracket and chandelier lights throughout the hall are frequently troublesome, but those on the platform and orchestra are the principal offenders. In Queen's Hall, London, some of these have been draped with great satisfaction. Lofty halls are best illuminated by direct lighting from the ceiling, by which the architectural and decorative features are more naturally displayed and the vast area of ceilings and walls better utilised for diffusion. Should the surfaces be lightly decorated, ample illumination will be obtained at a minimum of cost for gas or electricity. If grouped, the lights should be in more than one cluster—the more the better—or they may be arranged in lines and panels, but care should be taken that the foremost light does not subtend an angle of more than 30° above the rearmost seat. Additional lighting may or may not be required to this. In other cases the lighting may with many charming effects be distributed throughout the hall. Where the halls are long and the ceilings low, top lighting must be screened.

In domestic lighting, unlike the foregoing, the rooms are viewed from every ordinary point, the lights must therefore be placed or screened accordingly. The hard and unpleasant effect of exposed lights should not be obviated by the wasteful expedient of entirely covering the lamps with coloured silk or fancy paper shades, whereby the rooms are left in semi-darkness; but all screens and shades should admit of ceilings and walls being flooded with light. No occupation part of a living-room should have a light of less than 0.3 foot-candle.

In the drawing room there should be plenty of light from partially obscured sources, and if it is thoroughly diffused by means of well-illuminated walls and ceilings it will add attraction to the room and its contents.

In ball and reception rooms one should aim at brilliance and pleasing effect, for which glare and dazzle is but a poor substitute. It is hoped that the cumbrous and obstructive chandelier is a thing of the past; there are far better modes of lighting in which it is possible to do greater justice to the attractions of the room and its occupants, to say nothing of avoiding the frequent ophthalmic headache. In some cases the lighting may be made to produce soft and agreeable effects of its own, provided they do not interfere with the legitimate lighting of the room.

In the dining room the essential feature is the table; and nothing is better than a pendant or pendants, each with a large densely-flounced shade adjusted to a width that will

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just avoid the eye in sitting and standing. The tops of these shades should be open or fitted with opal glass to illuminate the ceilings and upper walls, and thereby, the room generally. In large or handsome rooms further protected lights will be needed to display the decoration and pictures, and at the sideboard.

As to bedrooms, many a bedridden and other person has suffered from bad lighting. The daintiness and charm of a well-furnished bedroom may be greatly enhanced by lighting on the lines laid down, which the one-sided daylight window often fails to do. No lights should be visible from the bed. Fancy lighting and such playthings as fairy lights help to destroy the legitimate attractions of the room. It would be profitable to extend the same principles to the servants' rooms and other parts of the house.

Porches, halls and staircases can be made very effective at a small cost, not by the addition of fittings, however elaborate or quaint, in the confusing light from which one is liable to find stumbling blocks in steps and mats, but by the judicious distribution of lamps that will illuminate ceilings, walls, and architectural features, and render perambulation safer.

Street lighting is, at present, extremely unsatisfactory; there is no diffusion, no reflection, nothing but a blinding display of lights in a background of darkness, that, amidst motor cars and the like, but serve to bewilder the bravest. Why should not these intense lights be shaded, the exteriors of the buildings as well as the pavements illuminated, and by the encouragement of diffused light the citizen be able to see what manner of place he is in, and to walk or drive comfortably and safely through it? It will have to come by and by.

NOTES AND COMMENTS.

THE Corporation of Glasgow has made a bold effort in the Smoke Abatement Exhibition that is now open to educate the citizens in the part they should play in lessening, not to say abolishing, the distressing murkiness from which Glasgow, in common with many other great cities, suffers. The lesson of the present exhibition at first sight seems to be that coal, at any rate of the bituminous variety, must be banished from the domestic economy of the future, and gas or electricity must be substituted in its stead. The cheerful open fire of the British home has got to go, with its healthful as well as pleasant radiated heat rays, its dirt, its smoke, and its extravagance—or ought we not rather to say, its luxury? Instead we are to put up with those closed-in, cheerless, non-pokeable arrangements of anthracite and coke that manufacturers offer. Doubtless these will warm us after a fashion, and without visible smoke, but the heat they give is largely convected from heated surfaces, and what we gain hygienically from the absence of visible smoke we lose in the sacrifice of radiated heat.

NOR is the prescription of gas and electric heating either palatable or hygienically perfect. Under present conditions it is impossible for either of these methods to compete in price without the assistance of convection from heated surfaces, usually of metal. We all know the popular saying that over-heated metal surfaces "burn the air" or dry it, but we suspect that our scientific physicists have not yet fully investigated the action of heated dark bodies as distinguished from incandescent upon the air they warm, and we expect that the hygiene of the future will teach us that convected heat is not only unpleasant but unhealthy. Even with incandescent bodies there is certainly more to be discovered than is at present known. It is but yesterday that the annihilating action of incandescent electric light upon microbic organisms has been suspected.

TOTAL abstinence from that which the majority of men know to be pleasant and instinctively, if not intelligently, feel to be right, is ever a hard doctrine to preach; hence the knights-errant of smoke abatement are tilting at windmills when they urge abstinence from open coal fires. They should rather encourage manufacturers to devise means for burning soft coal with a cheerful open flame in such fashion as to consume the smoke. With kitchen ranges this has become a *fait accompli*, and several examples are to be seen in the Glasgow Exhibition.

FOR the home fireside we have in one direction the preparation of patent fuels, such as coalite, charco, coalexld, and peat, but at present there is no abundant supply of these, and the British public should be educated or assisted to create a demand for these fuels, so that we may get out of the existing impasse, in which manufacturers are afraid to produce largely for want of a demand, and the consumers are loth to venture on their use from the dread of a deficient supply. The modification in form of the present open fire-grate to burn soft coal smokelessly is another, and we think most hopeful, direction of effort for the abatement of smoke from domestic chimneys. What seems to be a good device of this type is the sitting-room fire-grate of the Whiteflame Fire Co., exhibited at Glasgow, in which the fuel is fed at the top and burnt at the bottom of a hopper, thus partly carbonising the coal before burning.

THE Manchester City Council, after a full debate, has decided by fifty votes against thirty-six to adopt the report of the Infirmary Site Special Committee, which recommended the Council to agree to the building on the site of an Art Gallery and a Library at a cost of not more than 250,000*l*., the combined building to occupy an area of about 5,500 square yards. The Committee, by the decision of the Council, are authorised to proceed with the necessary preparations for obtaining competitive designs from architects for this building. The two Committees most closely concerned have already intimated their requirements, and provisional plans relative to those needs have been prepared by the city architect (Mr. HENRY PRICE). The Committee, however, did not go to the full extent of their powers. They resolved as their first step to invite the President of the Royal Institute of British Architects (Mr. LEONARD STOKES) to give assistance by nominating an assessor to act in conjunction with the city architect in this matter.

AMONGST the schemes that are on foot for memorials to King EDWARD VII., the Lord Provost of Edinburgh is credited with favouring the suggestion that a suitable national memorial in Scotland would be the restoration of Holyrood Palace, and such addition to and renovation of the old home of the STUARTS as would make it suitable for the present King to live in for a part of each year. From the point of view of sentiment there is something to be said for such an idea, but it has yet to be shown that the scheme is practicable and would appeal to Scotland generally. Holyrood is a gloomy pile, low-lying, without suitable surroundings and without privacy, being overlooked all round. It lies close to Canongate, one of Edinburgh's slum areas. Tall old houses, once occupied by Scotland's nobility, have been converted into tenement houses, now occupied by the poorest of the population. It is understood that the Government would be expected to put the Palace in order and make the additions necessary in order to render it habitable by Royalty, and that Scotland's part would be to clear away the slum area and make suitable approaches to the renovated Palace. The cost of the whole scheme would be very large, anything from a quarter to half a million sterling.

LIVERPOOL'S memorial is, we understand, to take the form of an equestrian statue of King EDWARD with two flanking symbolical figures by Mr. GOSCOMBE JOHN, to be placed at the base of the St. John's Lane end of St. George's Hall. We doubt if it is likely to be of sufficient size to avoid being overpowered by the mass of the Hall building, with which it is entirely out of scale and inharmonious in line.

FOR the use of those attending the R.I.B.A. Town-Planning Conference a very excellent "Members' Hand-

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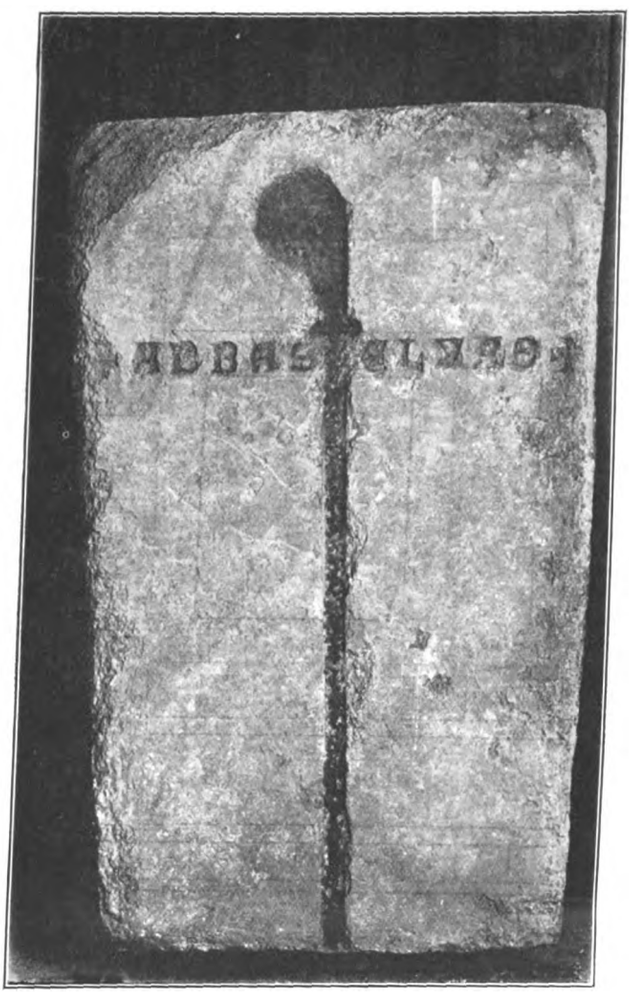
book" has been prepared, giving particulars of the many buildings and places to which visits are arranged, so that visitors may know something of what is to be seen and may make their choice when, as usually happens, there is a plethora of visits and excursions inviting their attendance. Short articles on each subject are contributed by authors whose claim to competence is indubitable, and, for the benefit of visitors from the Continent, the Handbook is produced in English and French side by side.

WE regret to have to announce the death of Mr. WILLIAM HALE, one of the prominent architects of Birmingham, at the age of seventy-five. He was the architect of many ecclesiastical, scholastic, business, and residential buildings. He was the designer of Messrs. LIBERTY'S premises in Corporation Street, a building that, in the judgment of many, is one of the most artistic pieces of architecture to be found in Birmingham. Mr. HALE was president of the Birmingham Architectural Association for several years, and was a Fellow of the Royal Institute of British Architects.

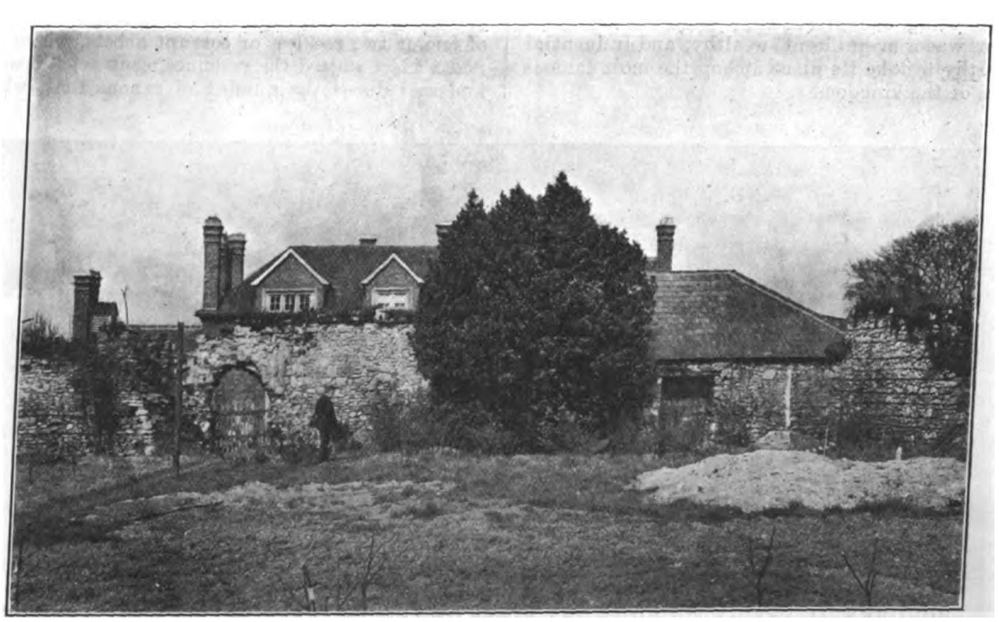
MR. BANISTER F. FLETCHER, F.R.I.B.A., will deliver a series of University Extension Lectures on "Ancient Architecture" at the British Museum on Tuesdays at 4.30 P.M., commencing October 4, and a series on "Mediæval Architecture" at the Victoria and Albert Museum on Mondays at 5 P.M., commencing October 3. Each of these courses will comprise twenty-four lectures, and tickets can be obtained from Miss CLAIRE GAUDET, hon. secretary, 120 Cheyne Walk, Chelsea.

ABBEY WOOD AND LESNES ABBEY.*

ON alighting at Abbey Wood station we proceed to a part of the wood, some quarter of a mile west of the abbey ruins, to see certain dene holes which have recently been discovered and opened by Dr. E. A. Baker, M.A., of Woolwich, and one of these now familiar pits was descended by most of our party under the guidance of Mr. R. H. Chandler, of Belvedere, apparatus for this purpose, consisting of windlass, rope and basket, with the assistance of some sturdy labourers, having been kindly and thoughtfully provided by Mr. M. H. Gray, of Lesnes Park. Little need be said to-day on the subject of dene holes, the mystery and romance, and even superstition which attached to them not many years ago having been almost obliterated by enlightened study and broad discussion, but it may be mentioned that the one inspected was of the ordinary double trefoil plan, with a depth of about 70 feet, of which 20 feet or so was through the chalk. As the subject of dene holes has of late years been exhaustively ventilated, it will be sufficient in this place to suggest that, judging from the fact that in these dene holes the chalk appears to have been hewn in large blocks, instead of in small pieces as is the case when it is required for agricultural purposes, it may reasonably be assumed that the pits were made and the chalk worked for use in the building of the abbey, more particularly as large blocks of chalk have been found in the recently exposed



LESNES ABBEY—TOMB SLAB OF ABBOT ELYAS, C. 1300.

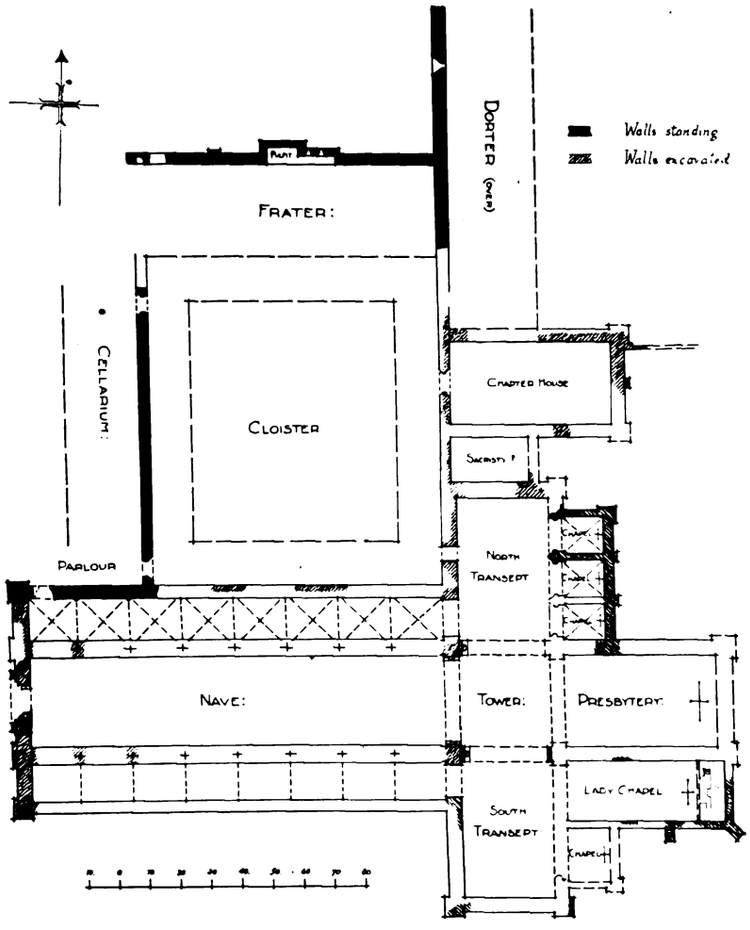


LESNES ABBEY—NORTH WALL OF FRATER (SOUTH SIDE), SHOWING BAY-TREE AND POSITION OF THE PULPIT STEPS.

* Read at a meeting of the Upper Norwood Athenæum by Mr. W. T. Vincent.

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foundations. A pleasant walk along a narrow lane and past the monastic stewponds, which are locally regarded as early docks for ship-building, led to the excavations at the abbey, which are very extensive, and fraught with interest and importance. In showing and describing the various revelations, I laid especial emphasis on the fact that the work done within the last few months has corrected historical inaccuracies of centuries standing, and proved that Lesnes Abbey, instead of being, as represented, a small and insignificant foundation, was a magnificent, wealthy, and influential institution, worthy to take its place among the most famous religious houses of the kingdom.



PLAN OF LESNES ABBEY.

In A.D. 1178 Richard de Luci, a rich and powerful Norman, founded the Abbey of Lesnes in the parish of Erith and county of Kent. He was, after the manner of his time, soldier, statesman and lawyer—fought many a defensive battle while acting as regent. During the absence of Henry II. in France he was instrumental in checking the arrogance of ecclesiastical authority at Rome, and the daring presumptions of Thomas à Becket in England, and he was for many years Lord Chief Justice, in which capacity he laid the foundations of our present court of King's Bench. But he grew aged, and like his Royal master, repented of his action against à Becket, and, as an act of penance, he resolved to build and endow an abbey at his manor of Lesnes, dedicating it to St. Mary the Virgin and Thomas the Martyr. He was himself one of its canons, but not abbot, as commonly supposed, and, as he died in 1179, it is probable that he left the completion of his abbey to his son Godfrey, afterwards Bishop of Winchester, who, like his father, found his last resting-place within its sacred walls.

In the autumn of 1909 the Woolwich Antiquarian Society commenced amongst the ruins some excavations, which were at first intended to be only simple and tentative, but discoveries followed of such importance as to lead not only to extensive works spread over a great area, but to much literary research, and the acquisition of most valuable material for reconstruction of the conventual annals. At Oxford, Rochester and Canterbury, as well as at the Record Office, British Museum, &c., many MSS. inquisitions, deeds, charters and other documents relating to the abbey have been found, and their substance collated by Mr. A. W. Clapham, a member of the Woolwich Antiquarian Society, the results of which may be measured by the fact that the list of known abbots and priors, which has hitherto contained but three or four names, has now been extended to thirty-one. The establishment appears to have been on a large scale, comfortably endowed, benevolent and prosperous. It is more than probable that the brotherhood, which was of the austere and laborious Augustinian Order, constructed the huge embankment known as the river wall, thus not only enriching their possessions by the lands enclosed and cultivated, but deepening and quickening the channel of the Thames, and making it the eminently navigable stream which has for centuries past waited on London. In peaceful, useful and pious work the abbey pursued its uneventful way for 300 years or more, and then, as the clouds were gathering for the impending storm which swept away all the monks and monasteries, Lesnes had the lamentable experience of falling under the domination of one or two reckless or corrupt abbots, whose extravagance and neglect wasted the revenues, contracted heavy liabilities, and so reduced the number of canons that, when the crisis came Cardinal Wolsey found it an easy prey, and seized it as one of his first spoils for the endowment of his new college at Oxford. This was in 1525, at the very outset of the Dissolution period. Some provision appears to have been made for the deposed abbot, but the monks, of whom there were not



MONUMENTAL EFFIGY FOUND IN THE RUINS OF LESNES ABBEY BEARING THE ARMS OF DE LUCI, OF NEWINGTON, KENT, C. 1320.

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more than seven left, were scattered, much to the regret and vexation of the people, who were not slow to mark their resentment by refusing to work for their new masters. For while Wolsey appropriated the abbey and its money, King Henry VIII. took possession of the marsh-lands, which, thereafter, for want of care, suffered greatly from inundations, and were not again recovered for 100 years. After Wolsey's fall the king installed certain of his favourites successively in the abbey, and for many generations the abbot's lodging was occupied as a country house by gentlemen at court, while the remainder of the buildings were either wantonly destroyed or left to pillage and decay. In 1620 Sir John Hippersley, a soldier and courtier under Charles I., employed some men to quarry among the ruins for stone to make roads, build walls and cottages, or some such purposes, as his predecessors had done, when a coffin was found, surmounted by the stone effigy of a knight in armour, and containing the remains of a man believed to be the founder, Richard de Luci. Hippersley had the tomb, which was in the church choir, reburied at the same spot, to indicate which he planted a bay-tree. Then comes a long blank time, within which, however, are two certain inferences; one that the coffin was not allowed to remain undisturbed, but was violated and rifled; the other that the original bay-tree in some way disappeared, but was subsequently succeeded by a new bay-tree reverently planted by a later resident, but planted in the wrong situation. This, historically speaking, was a fatal error, for when Stukeley the antiquary visited the abbey in 1750 and saw the bay-tree against a crumbling wall, he drew and published a sketch and plan which have misled everybody ever since. For the wall which Stukeley indicated as part of the church is now proved to have been the north wall of the refectory. And the church, instead of being north of the cloisters, and a small affair 20 feet by 90 feet, is now known to have been a grand edifice south of the cloisters, 66 feet broad by 230 feet long, and, greatly as it has been devastated, much of it remains, including the bases of columns and arches in the nave and aisles, and massive masonry representing two of the four piers which supported the central tower. The church, like most Norman edifices, was cruciform, with chapels in the transepts, some of which have been laid bare and yielded a rich collection of archæological treasures. On the north side of the choir has been discovered a stone coffin minus the lid, with an inner casing of lead, which had been ripped open, and contained the bones of a man of medium stature, and, judging by the teeth, about 65 years of age. Close by lay an iron crowbar and mattock, apparently the instruments of desecration. Under the tower was the



LESNES ABBEY.—DOORWAY ON WEST OF CLOISTER.



LESNES ABBEY.—DETAIL OF SOUTH-WEST PIER OF TOWER.

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tomb-slab of Abbot Elyas, engraved with his name in thirteenth-century characters, but stripped of its brass ornaments, and on the floor of the Lady chapel were two highly decorated slabs from the tombs of ladies, these also bereft of all but fragments of their brasses. There were also vaults in the Lady chapel, into one of which had been rudely thrown the heroic effigy of a cross-legged knight, richly coloured, and bearing the arms of the de Luci family. The shape of his coat and armour and the presence on shield and breastplate of the de Luci badge with cross-crosslets, leaves scarcely a doubt that the knight was one of the Newington Lucies, circa 1310. Examples of early pigments so perfectly preserved as the colouring on this effigy are rare, as the paint grows dim and disappears after long exposure to light and atmosphere, which in this case have been excluded by burial deep in the earth. It is hoped that by carefully protecting the stone until it is quite dry it may then be possible to ensure its permanence and beauty. It will probably find its way eventually into one of the national museums, to which also the several slabs just mentioned may be worthily consigned. Many hundreds of paving tiles, mostly of excellent design and workmanship, have been unearthed, and these were undoubtedly manufactured by the monks in their own tile-houses, many of the patterns being unique. Large quantities of stained glass in fragments have also been found, especially in the Lady chapel. The tiles and glass are of the thirteenth and fourteenth centuries. A curious chamber found in the Lady chapel, presumably under the position of the high altar, must also be mentioned. It is barely 2 feet below the floor-level, and instead of being rectangular, as an architect would have planned it, is almost bottle-shaped, the neck formed by a narrow stairway just sufficient for one person to descend from the chancel. It cannot have been for a sepulchre, being too small, and all ideas of its having had a mean purpose of any kind are forbidden by its venerated situation and handsome paving. The most feasible theory is that it was constructed by the brotherhood as a strong room for the safety of their relics, the interior of the altar above it affording ample headway for the priest who had charge of the sanctuary.

In addition to the church and chapels, the chapter-house on the north side has been partly excavated, and the positions of the sacristy, cellarium, and other offices have been ascertained with some certainty. The head of a stairway leading underground is to be seen in the frater wall, and this has long been pointed to as the approach to an underground passage extending two miles to Plumstead Church. Legends of this kind are usual wherever ancient buildings exist, and the Lesnes story had some support in the bold assertion that a plan of the abbey and the subterranean passage were to be seen in the Vatican at Rome, but it is satisfactory to say that as a result of inquiries the librarian of the Vatican declares that, contrary to common belief, there are not to be found there any plans or documents relating to any one of the English abbeys. The books and other properties are most likely to have gone the same way as their revenues, and the bulk of the Lesnes archives are now in the libraries of Corpus Christi and St. John's Colleges at Oxford.

There is still much to be done if the investigation so well begun is to proceed to a satisfactory conclusion, but the Woolwich Society, though it has raised and nearly expended about 90*l.* during the past year, has been obliged to ask for help. The Society of Antiquaries and the Kent Archæological Society have made grants towards a suggested fund of 500*l.*, and a very distinguished committee has been formed to support the work, the members of which include Lord Avebury, Lord Northbourne, Sir Edward Brabrook, Mr. G. L. Gomme, Mr. C. R. Peers, Mr. St. John Hope, and many other well-known antiquaries.

EXCAVATIONS AT MEMPHIS.*

NO instance of a stone-built tomb is known before the end of the Second Dynasty, when King Khasakhamui built a stone chamber at Abydos. Not till the latter part of the Third Dynasty did stone-built chambers become the custom, even for kings. The oldest stone tombs of subjects are those at Meydum, which were opened by the British School this last winter. The great mastabas of Nefermaat and another noble, close to the pyramid of Sneferu, the interiors of which had defied modern search, were attacked in a thorough manner. The mound over the tomb, No. 17, was mined through to a depth of 45 feet. At the bottom was found a closed stone building, which had been completely buried beneath the mound, without leaving any external opening. The burial had, therefore, taken place before the mound was thrown up, and as the material of the mound was clearly from the mason's waste left in building the pyramid adjacent, the burial must have been made before the date of the pyramid of Sneferu, 4650 B.C. This is the earliest private stone tomb that can be dated. The passages are lofty, and the great chamber is roofed with beams of stone which weigh up to 40 tons each. In a recess at the end of the hall stands the sarcophagus of red granite, the oldest stone sarcophagus known. The burial is of the greatest interest, as it shows that the body was completely unfleshed before it was wrapped in linen. The bones had been completely stripped and severed, excepting that the spine was not dissevered. Each bone was then wrapped separately in fine linen, the spine was packed closely with linen, and linen was pressed into the empty eye sockets. A cloth model of the penis was very carefully formed and placed in the wrappings.

The skull was found with the rest of the bones in the granite sarcophagus. The measurements of the skull are:—Length, 187 mm.; ophryon, 186; breadth, max., 141; bi-auricular, 118; bi-zygomatic, 123; height to bregma, 140; basi-nasal, 99; basi-alveolar, 87; nasi-alveolar, 79; nasal height, 59; width, 24; nasion to chin, 127; jaw length, max., 119; breadth at joint, 121; breadth at base, 101. As compared with usual Egyptian heads this is large, with narrow face, extremely orthognathous, and very narrow nose.

The neighbouring tomb of the noble Nefermaat is the largest of all, the size being 380 feet by 206 feet. The body of it is of Nile mud. A pit 34 feet square had been sunk in the rock, 5 feet of mud had been poured into it and left to harden, then the stone chamber had been built upon that, and heaped over and around with large blocks of stone. This arrangement is unique, as also is the inlaid colour decoration of the tomb-chapel. The burial of Nefer-maat again proved to have been an unfleshed skeleton. It was in bad condition, as the last workmen before closing the chamber had rifled the body and broken up the wooden coffin.

A very important result has been the finding a series of quarry marks of Sneferu, which cover the whole range of the working season. This, we know, by the conditions of the country, was from April to October, and thus we find the interval from the XIIth to the IIIrd Dynasty to be 1113 years, with about forty years of uncertainty. This accords nearly with Manetho's statement of 1198 years, and gives the date of 4600 B.C. for Sneferu, the first of the Pyramid builders.

The other main results of the season were the removal of the whole of the sculptures of Meydum, the earliest known, to Cairo and other museums for safety; the successful opening of the low levels of the great temple of Ptah at Memphis by working 10 feet under water level, and beginning thus to find the sculptures, a work that will occupy twenty years at least, and the finding of many sealings of Persian and early Greek work which illustrate the fifth and sixth centuries B.C.

* Abstract of a paper presented to the British Association at Sheffield, 1910, by Professor W. M. Flinders Petrie, D.C.L., F.R.S.

ILLUSTRATIONS.

COUNTY ASSEMBLY ROOMS, LEICESTER.

THE County Assembly Rooms were erected in 1792 by JOHN JOHNSON, for twenty-six years architect and surveyor to the Essex County magistrates. The building was erected at a time when clubs were becoming fashionable, and the cost was defrayed by subscription shares. In 1825 the building was bought by the County authorities, and some of the rooms were fitted up for the use of the judge as a lodging during the assizes. The ground floor consists of a suite of rooms which were used for club purposes, and the ballroom over is 75 feet long by 33 feet wide and 30 feet high, and is decorated in the Adams style. It contains a minstrel gallery and a fireplace at each end, with sculpture by Mr. ROSSI, R.A., on either side. The coved ceiling was originally divided into three compartments, and the walls and ceiling were decorated with allegorical paintings of Aurora, Urania, and Luna. The two figures in niches on the front façade represent comic and lyric muses.

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The County Assembly Rooms



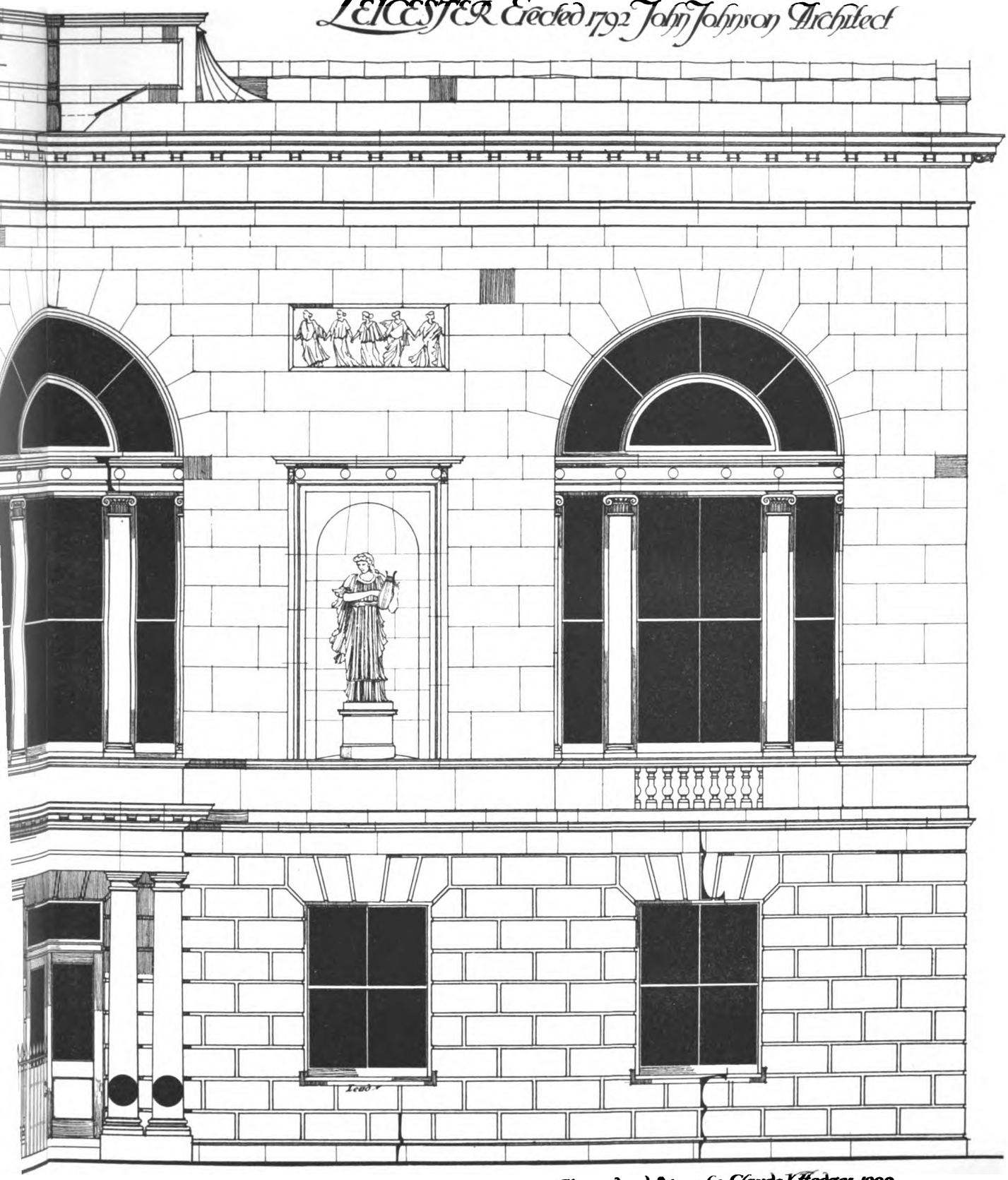
Scale of feet

Façade

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The Builder Sept: 30th 1910.

LEICESTER Erected 1792 John Johnson Architect



Measured and Drawn by Claude V Hodges 1909

PHOTO LITHO SPRAGUE & C° L^TD 4 & 5 EAST HARDING STREET, FETTER LANE E.C.

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The County Assembly Rooms

LEICESTER : Erected 1792 : Details :

: Note : Walls are brick faced with Attleborough Stone : : and Staithland Slate roof :

Capping

Cap

Porch Cornice

Porch Columns

Baluster

Marble Base

Cornice for Large Windows and Recesses

Inches 1 2 3 4 5 6

Scale for Details

Ground Floor Plan

10 8 6 4 2 0 10 20 30 Scale of feet



Pedestals

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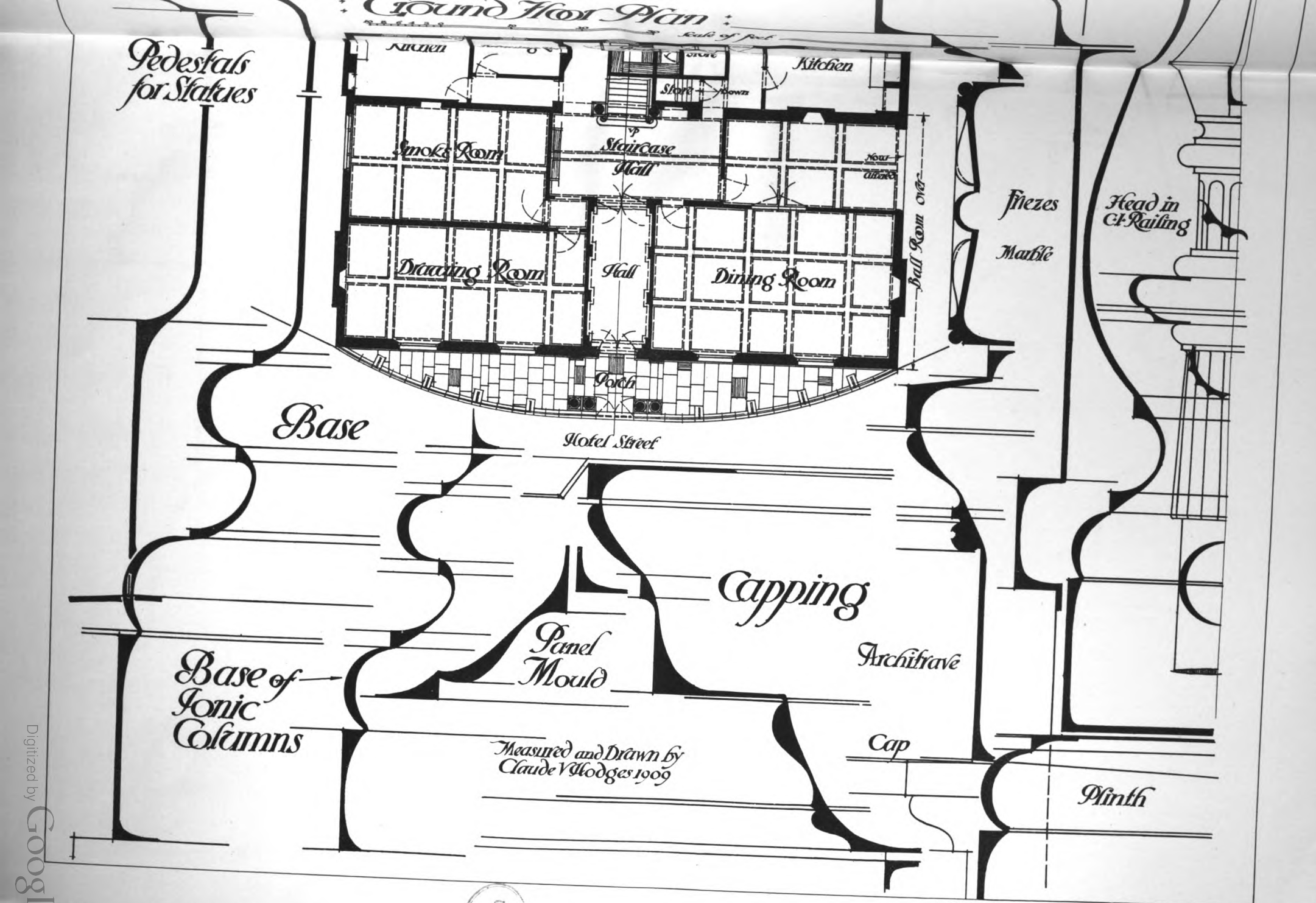


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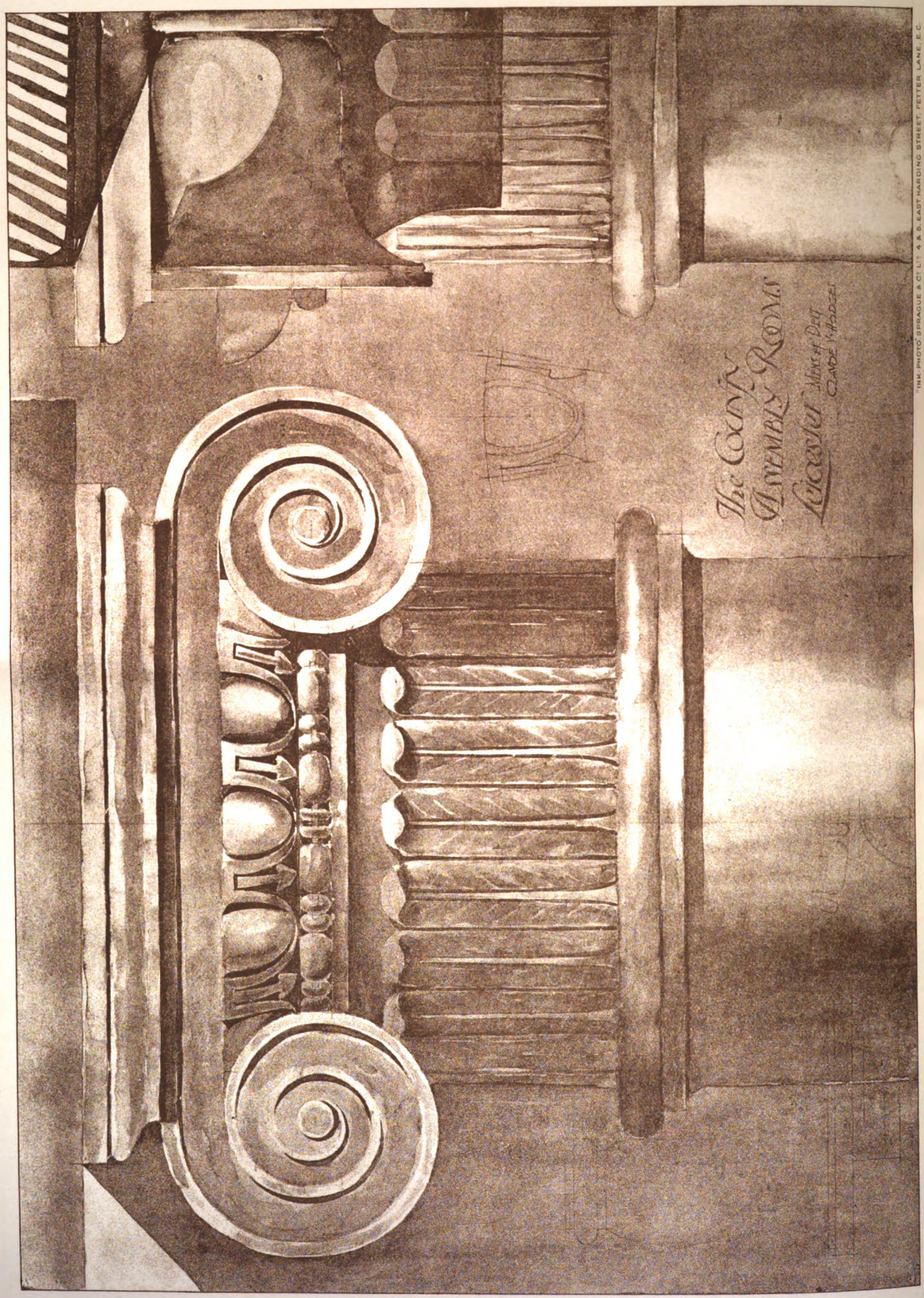
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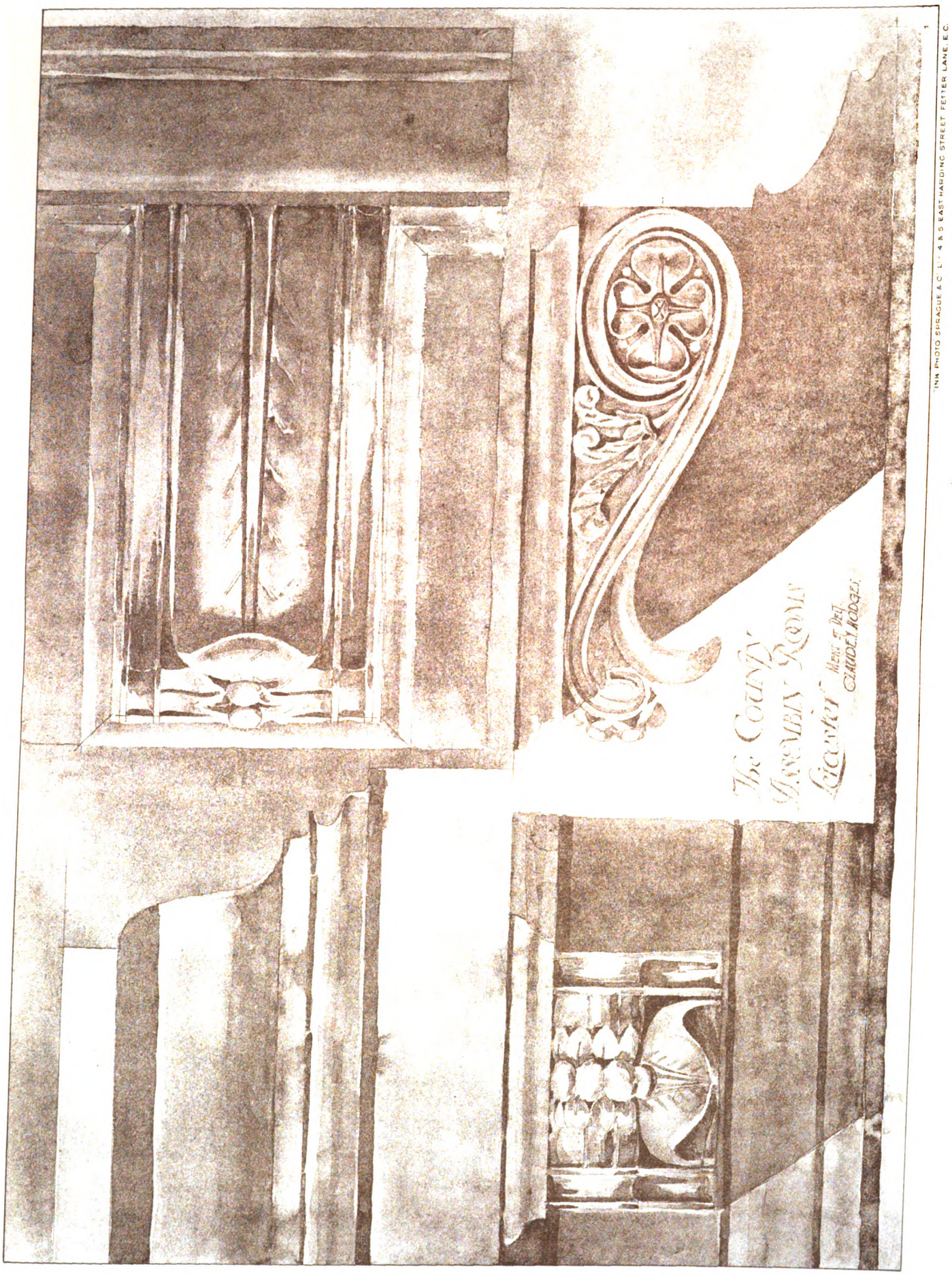
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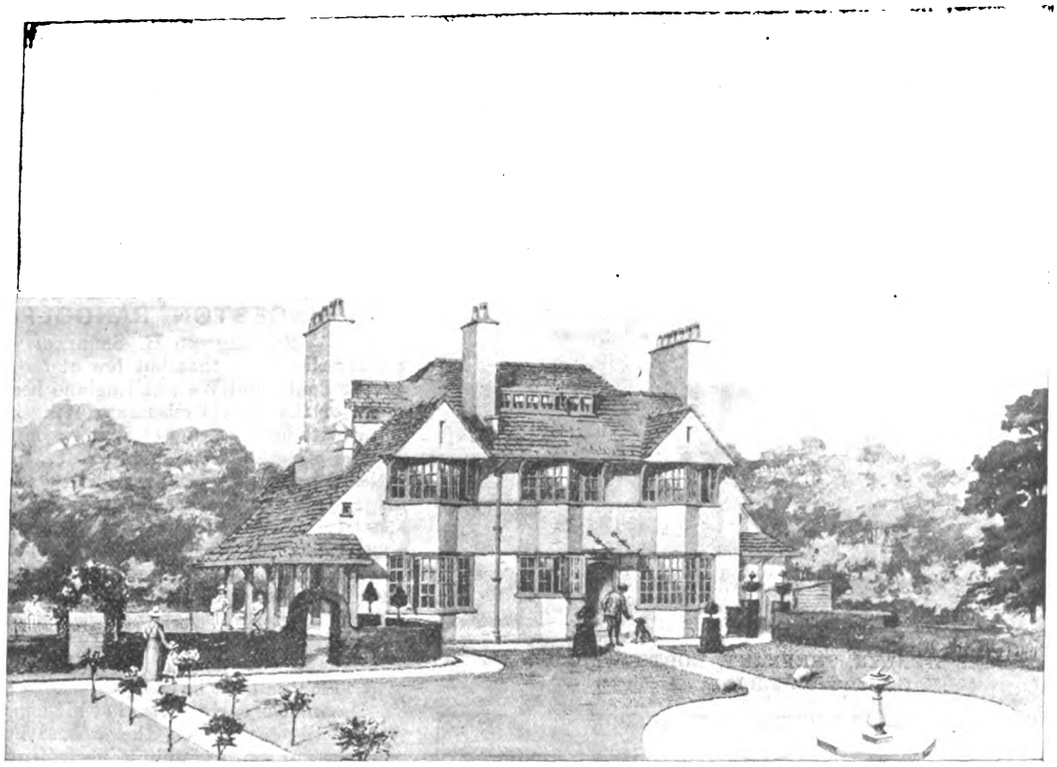
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THE FIFTH HOUSE, POTTER'S BAR. [From *The English Home.*
Messrs. BANISTER FLETCHER & SONS, Architects.

THE ENGLISH HOME.

PERHAPS the most important desideratum at the present time for the Art of Architecture is the intelligent appreciation by the layman, the "Philistine," as Sir HUBERT HERKOMER calls him, of what is meant by and what is comprehended within the domain of the Mistress Art. There is probably no way in which this appreciation can be better fostered than by enlisting the instincts and sympathies of the Englishman for his home as the basis of a study of architecture, and hence we think good service is likely to be rendered to the Art of Architecture by the latest literary production of Messrs. BANISTER F. FLETCHER and H. PHILLIPS FLETCHER.*



[From *The English Home.*
BENGEO HOUSE, HERTFORD.
Mr. WALTER CAVE, F.R.I.B.A., Architect.

The scheme of the book comprises a short historical account of the development of English house-planning and an exposition of the many considerations that have to be taken into account by an architect in selecting a site, arranging the plan, the construction, the sanitation, the fitting, the finishing, and decoration of a house, in addition to the clothing of his design with more or less beauty. Then a selection is given of characteristic examples of modern English homes designed not only by the authors, but also by ARTHUR T. BOLTON, WALTER CAVE, E. GUY DAWBER, FORSYTH & MAULE, ARTHUR KEEN, E. L. LUTYENS, MAURICE H. POCOCK, A. N. PRENTICE, M. H. BAILLIE SCOTT, C. HARRISON TOWNSEND, and C. F. A. VOYSEY.

We are pleased to find that in their historical sketch the authors have rightly laid stress on the importance of the hall as the basis of English house-plans from Saxon times until the later Renaissance period.

The practical application of good principles in external design is well expounded, with particular reference to practical as well as æsthetic qualities of various materials and varied forms of features or components of buildings. This makes very useful instruction for the lay reader, who, when he becomes a client, will be ready to agree with the preference of his architect for small squares rather than huge sheets of plate glass, for tile roofs instead of Bangor slate. With the authors' recommendations as to the planning of the various parts of a house there is little fault to find, though, in one or two instances, there are points in the examples illustrated that are more than questionable, some of the arrangements of doors and fireplaces being particularly provocative of smoky chimneys.

The thoroughness with which the construction of houses is dealt would almost imply that the book was prepared for professional rather than amateur students of architecture, but in a work intended for the laity in particular it is perhaps just as well to let them see that there are many matters connected with the building of a house of which they have never dreamt, but the proper treatment of which makes the difference between an architect's house and a jerry-builder's villa. A good suggestion for a hygienic floor is shown in illustration 31. The covered dry area

* *The English Home.* By Banister Flight Fletcher, architect, F.R.I.B.A., F.S.I., barrister-at-law of the Inner Temple, and Henry Phillips Fletcher, architect, F.R.I.B.A., F.S.I., A.M.I.C.E., barrister-at-law of the Middle Temple. With an introduction by his Grace the Duke of Argyll, K.T. (London: Methuen & Co. 12*s.* 6*d.* net.)

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in illustration 27 is, however, not to be recommended, as this type almost invariably lets the damp through in the course of a few years, and in illustration 23, the arrangement of damp course for a hollow wall is faulty.



[From *The English Home.*

MAES HENLYN, TREFNANT, NORTH WALES.
Mr E. GUY DAWBER, F.R.I.B.A., Architect.



[From *The English Home.*

GREY WALLS, GULLANE, N.B.—Mr. EDWIN L. LUTYENS, F.R.I.B.A. Architect.

We wonder what kind of "hard stocks" are more absorbent than "ordinary London stocks."

If there is one thing more than another that the average householder considers worthy of attention when he is choosing or building a home it is the drains, and this is perhaps the reason why the authors have devoted so much space comparatively to this subject, but we are pleased to note that the amateur student is instructed that other matters are also important in the sanitation of a home, water supply and its fittings, baths, lavatories, and other so-called sanitary fittings, the collection and disposal of refuse, heating, lighting, and ventilation, all of which are very fully and adequately treated, with a great deal more up-to-date information than is to be found in the majority of text-books offered for professional students.

The illustrations show excellently well the work of some of our best present-day architects in the designing of English homes, of moderate size, including examples in Scotland and Wales, and costing as a rule between 1,000*l.* and 4,000*l.* Some of these, by permission of the authors, we are able to reproduce, and thus it will be seen that the book will be usefully suggestive to the young professional student as well as for the amateur, for whom it is primarily intended, and who would rise from its perusal with correct ideas as to the elements of a comfortable and beautiful English home.

THE LATE REV. PREBENDARY HINGESTON RANDOLPH.

By EDMUND H. SEDDING.

IT is safe to say that but few of the clergy in the South and West of England heard of the death of the Rev. Prebendary Hingeston Randolph without a feeling of strong sympathy and a sense of loss. His genial nature, his conversational powers, and his wide and general knowledge, made him a strong and attractive personality. He died (as we say) in harness, in the little village of Ringmore, South Devon (about 10 miles from Ivybridge station), where he had just completed his fiftieth year as incumbent, after a short illness, at the ripe age of seventy-eight. It is not too much to say that this ardent churchman and distinguished scholar has left a gap which will not be easily filled.

During the early portion of his long career he voluntarily undertook the restoration of the churches of St. Columb Minor, Zennor, Manaccan, and the tower of St. Colan, which will always be regarded as types of conservative restoration. His antiquarian and architectural knowledge was considerable, and he was frequently appealed to for guidance in the diocese of Exeter, where he was so well known. His acquaintance with all kinds of materials in wood and stone made him a useful referee to many of the clergy and laity. In addition to the above-mentioned work of repair, he superintended more than one new church, and acted as architect for the enlargement of his own rectory, and gave his services as architectural assessor in three competitions.

During the initial stages of the building of Truro Cathedral the late John Pearson decided upon the entire removal of St. Mary's Church. It was mainly owing to Prebendary Hingeston Randolph who was ultimately supported by Archbishop Benson, at that time Bishop of Truro, that the south aisle was preserved in situ. The nation owes a debt of gratitude for his long struggle for its preservation. His long, appealing letters in



[From *The English Home.*

HOMELEIGH, POTTER'S BAR—THE SITTING-HALL.
Messrs. BANISTER FLETCHER & SONS Architects.

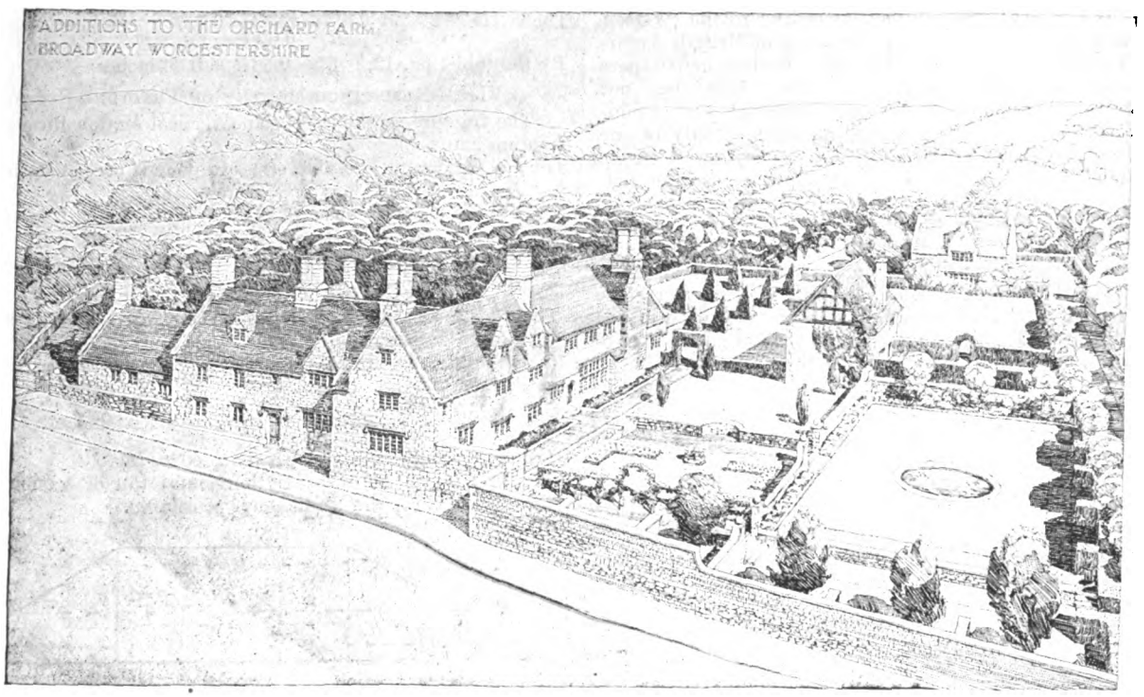
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the *Times* did much to bring about the successful result, and it is only fair to offer a warm tribute to the architect of the cathedral for the masterly way in which he incorporated this delightful piece of late fifteenth-century architecture.

In spite of the enormous work of research in compiling the diocesan registers of Exeter, he invariably found time to answer his numerous correspondents. Those who had the privilege of being among the number will always remember his replies, which were models of precision and beautiful penmanship. My acquaintance with him extended over a period of twenty-two years, and I may say that I never met with a more reliable and unselfish correspondent.

Those who knew something of the difficulties of deciphering and translating the early registers of the Exeter diocese, which of course embraced Cornwall, must have been struck with his extraordinary patience and perseverance. The necessary mass of papers and documents which had to be dealt with were carefully put away and locked up before visitors were allowed into his study, which was a model of neatness. His well-regulated mind was gifted with an extraordinary memory which enabled him to discuss matters in which he was especially interested (such as old church architecture) with extraordinary accuracy. He undertook the repairing of the beforementioned churches after they had fallen into a sad state of neglect and decay, and at the time of his visits during the progress of the churches, in which he was keenly interested, his one thought was to preserve all that was possible. Perhaps the most successful of his undertakings was the restoration of Manaccan. During the work at Zennor he discovered the lower portion of a thirteenth-century lancet window, which had been walled up, the eastern light being admitted by a clumsy modern window. As many of the old stones as could be found in the wall were re-used in re-forming this very unusual feature, viz., a single lancet in the east wall of the chancel.

The untiring energy which he devoted to his literary and architectural works brought him no remuneration—indeed, his life seems to have been concentrated upon the bestowal of his time and labour for the good of the Church and churchmen.



ORCHARD FARM, BROADWAY, WORCESTERSHIRE.—Mr. A. N. PRENTICE, F.R.I.B.A., [From *The English Home.* Architect.

NOTES ON BOOKS.

"The Pricing of Quantities." By George Stephenson. (London: Constable & Co. 8*s.* net.)

THIS book consists of examples of the pricing of bills of quantities for a detached residence and for a block of modern flats. In a work of this kind it is more than ever necessary to facilitate reference to every item, but for some reason those in the bills of quantities on pages 1-6 are not in distinctive type, as are those in the rest of the book, so that the items and remarks appear to be somewhat mixed together. There are no head lines at the top of each page to assist one as to the work that the same deals with and as to the trade that is being priced. It would probably have been better if the form of the bills of quantities had been adhered to and each item worked out thereon, and this would have obviated the apparent discrepancies in some instances. This is especially noticeable in the case of the superficial item of 6 inches of concrete over site, which many students might easily misinterpret on page 7.

We think it would also have been better if the drawings had been given so that the student could refer to each item. Generally speaking an amount of about 10 per cent. for profit has been added, but in some instances the student is told to add for profit, but such amount is not stated. No definition of "prime cost" is attempted and the author curiously enough suggests on page 77 that a discount should be allowed off the same, and yet on page 206 assumes that none would be allowed. On page 125 we find with regard to coke breeze and cement that a floor of this kind is "not fireproof, but fire-resisting, like most of the patent fireproof floors in use" (*sic*). The index only occupies some four and a half pages, and might well be extended. The book must have involved a good deal of labour and will no doubt be of service, but it is a pity that more finger-posts are not used in order to assist the reader.

"The London Citizen's Year Book, 1910." (London: George Allen & Sons. 2*s.* net.)

It is somewhat remarkable that whereas *The City of London Directory* has been published annually for some forty years, we should have to wait until this present summer for a year book dealing with London as a whole. The *London Citizen's Year Book* describes the work of London government, its machinery and cost; and it discusses the problems of local administration and taxation. The subject is necessarily an extensive one, for there are no less than 144 local governing authorities of the administrative county of London, with a membership of over 4,000. It is scarcely to be wondered at that most people are confused as to the interrelations of this world of officialdom. The *Year Book* has come to throw some much-needed light on the matter. This handy book of reference is more than a directory, for it includes short and lucid explanations of the work of the London County Council and its chief departments, of the Metropolitan Water Board, London elections, lighting, finance of London government, and the metropolitan police, &c. It ought to be a matter of civic pride to every Londoner that he possess a fairly clear idea of how the greatest city in the world is "run." It is not essential that he should do so, but such a knowledge would foster the finest spirit of

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citizenship and make his judgments rest on a deeper foundation than they do at present. The *Year Book* contains suggestive chapters giving a general survey of questions which are extremely prominent at elections, but which for the rest of the time lie dormant. The vexed subject of the reform of London government occupies about twenty pages closely printed. It is followed by "Poor Law Reform," and brief accounts of the London County Council Works Department, which was abolished in 1908, a municipal tariff reform policy and municipal trading.

"The Green Book of London Society." Edited by Douglas Sladen and W. Wigmore. (London: J. Whitaker & Sons, Ltd. 5*s*. net.)

This publication, which claims "the honour of being the first annual book of reference published in the new reign," professes to be a directory of celebrities, and asserts its superior accuracy to that of older competitors in the same field. As we cannot spare time to edit the whole of its 487 pages, we have directed our attention to the accuracy of its information in our special province of architecture. We find that the names given as those of the presidents of the Royal Institute of British Architects and of the Architectural Association are the penultimate holders of the office on one page and the ultimate on the next. The list of the leading architects of London is, we should say, rather a mixed one, and there are several mistakes in the spelling, whilst it is curious that only one, according to the "Green Book," is a member of the Royal Institute of British Architects! Our journal figures amongst the "leading newspapers of London"—with the wrong name for editor—but not amongst "the principal periodicals connected with architecture." The *Builders' Journal* also is named only in one list, but conversely. The *Architectural Review*, according to the "Green Book," is not worthy of a place in either list. The *Builder* and the *British Architect* apparently have no editors. In the list of "Societies connected with Architecture" we find the "Wren Book Club," and we wonder why this alone should be named of the many little private coteries that exist in the social life of London's architects. Certainly the "Green Book" is not superlatively accurate with regard to architecture. Turning to another branch of social life, of which we know something, we find inaccuracies in the list of leading yacht clubs, whilst that of leading British racing yachts is a long way from being up to date, as it contains names of boats that are not now racing, and omits some of those that are.

A STUDY OF BASE AND BEARING PLATES FOR COLUMNS AND BEAMS.*

By N. CLIFFORD RICKER, Professor of Architecture, University of Illinois.

(*Continued from page* 160.)

VII.—RESULTANT BENDING MOMENT ACTING ABOUT FRACTURE LINE.

Let A = total area of the plate in square inches;
P = total load in pounds transmitted by it;
L' = perpendicular distance in inches from fracture line to centre of upward pressures on one-half the area of the plate;

then L' = 0.25 × length in inches of a wall or bearing plate;
= 0.25 × side of a square plate;
= 0.2187 × inscribed diameter of octagonal plate;
= 0.2122 × diameter of circular plate.

Let L'' = perpendicular distance in inches from fracture line to centre of downward pressures on one-half the area of the plate;

then L'' = 0.25 × width of a beam or girder on a bearing plate;
= 0.25 × side of a solid square post or column;
= 0.2187 × diameter of solid octagonal post or column;
= 0.2122 × diameter of solid cylindrical post or column.

Let R = radius of outer circle inscribed in cross section of hollow square or cylindrical column;
r = radius of inner circle inscribed in hollow square or round column;

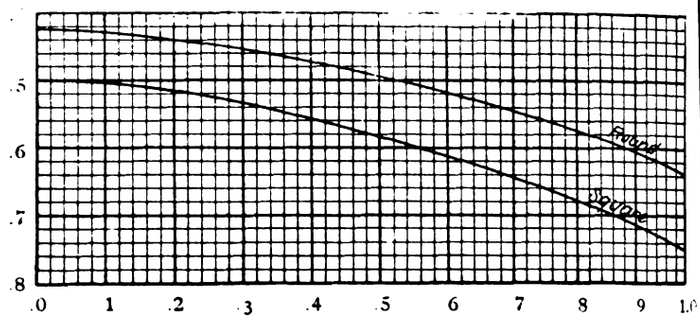
Then $L'' = 0.500\,\dfrac{R^3 - r^3}{R^2 - r^2}$ for a hollow square column.

Limiting values are $\begin{cases} 0.500R \text{ for a solid column.} \\ 0.750R \text{ for a very thin shell column.} \end{cases}$

Also $L'' = .424\,\dfrac{R^3 - r^3}{R^2 - r^2}$ for a hollow cylindrical column.

Limiting values are $\begin{cases} 0.424R \text{ for a solid column.} \\ 0.637R \text{ for a very thin shell column.} \end{cases}$

These values of L'' may readily be found by calculation, but much more easily by the aid of the graphical table, fig. 12.



MULTIPLY BY R TO OBTAIN L''.

FIG. 12.

Example.—Assume a hollow cylindrical column, 12 inches external and 9 inches internal diameter.

Then $\dfrac{r}{R} = \dfrac{4.5}{6.00} = 0.75.$

By the table, fig. 12, $L'' = 0.56R = 3.36$ inches.

VIII.—RESISTANCE MOMENT OF FRACTURE SECTION.

The fracture section is a plane vertical section through the fracture line.

Let f = maximum safe fibre stress in pounds per square inch.
B = length in inches of fracture section.
t = thickness in inches of plate at centre under column.
I = moment of inertia of the fracture section.
c = vertical distance in inches from horizontal neutral axis to bottom of fracture section.

Then $\dfrac{fI}{c}$ = maximum safe resistance moment of fracture section in general.

(*a*) For a rectangular fracture section of plate of uniform thickness,

$\dfrac{fBt}{6}$ = maximum safe resistance moment.

(*b*) For tapered section with sharp edges (fig. 13).

Let k = length in inches of horizontal top of section under column or diameter of column.

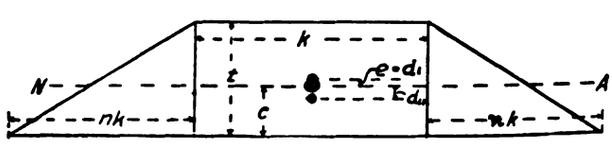


FIG. 13.

nk = length in inches of each tapered portion of the fracture section.
$B = k(2n + 1)$ = length in inches of fracture section.
$A' = kt$ = area in square inches of rectangle in fig. 13.
$A'' = nkt$ = area in square inches of both triangles in fig. 13.

$d' = \dfrac{nt}{6(n + 1)}$ = vertical distance in inches from centre of gravity of rectangle to neutral axis of fracture section, fig. 13.

$d'' = \dfrac{t}{6} - \dfrac{nt}{6(n + 1)}$ = vertical distance from centre of combined triangles to neutral axis of fracture section, fig. 13.

$c = d'' + \dfrac{t}{3}$ = vertical distance in inches from neutral axis to bottom of fracture section.

Also $I = \dfrac{kt^3}{12} + ktd'^2$ = moment of inertia for rectangle.

$I = \dfrac{nkt^3}{18} + nktd''^2$ = moment of inertia for combined triangles.

Finally $\dfrac{fI}{c} = \dfrac{fk}{c}\left[\dfrac{t^3}{12} + td'^2 + \dfrac{nt^3}{18} + ntd''^2\right]$ = safe moment of resistance of fracture section of the plate. (7

(*c*) For tapered section with thick edges (fig. 14).

Divide the fracture section into two rectangles and two triangles as in the figure.

* From a publication by the University of Illinois Engineering Experiment Station.

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Let t = thickness in inches at the middle of the plate.
t' = thickness in inches at the edges.
$t'' = t - t'$ = thickness of the taper in plate.

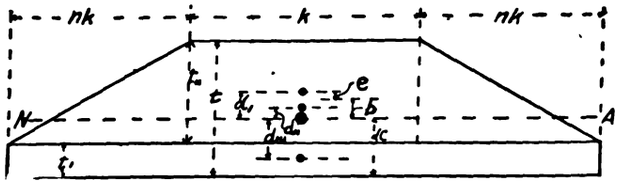


FIG. 14.

Then $A' = kt''$ = area in square inches of the upper rectangle.
$A'' = nkt''$ = area in square inches of combined triangles.
$A''' = (2n + 1)\ kt'$ = area in square inches of lower rectangle.

$$e = \frac{nt''}{6(n+1)} = \text{vertical distance in inches from centre of gravity of upper rectangle to joint centre of gravity of this rectangle and combined triangles.}$$

$$b = \left(\frac{t}{2} - e\right)\frac{A'''}{A' + A'' + A'''} = \left(\frac{t}{2} - e\right)\left[\frac{(2n+1)t'}{t' + nt'' + (2n+1)t'}\right] = \text{vertical distance in inches from the preceding joint centre of gravity to the neutral axis of fracture section.}$$

Then $d' = e + b$ = vertical distance in inches from centre of gravity of upper rectangle to neutral axis of fracture section.

$$d'' = d' + \frac{t''}{6} = \text{vertical distance from centre of gravity of combined upper rectangle and both triangles to neutral axis of fracture section.}$$

$$d''' = \frac{t}{2} - d' = \text{vertical distance in inches from centre of gravity of lower reetangle to neutral axis of section.}$$

Then $I' = \frac{kt''^3}{12} + kt''d'^2 =$ moment of inertia of upper rectangle about the neutral axis.

$$I'' = \frac{nkt''^3}{18} + nkt''d''^2 = \text{moment of inertia of combined triangles about the neutral axis.}$$

$$I''' = \frac{(2n+1)}{12}\ kt'^3 + (2n+1)\ kt'd'''^2 = \text{moment of inertia of lower rectangle about the neutral axis.}$$

Finally, summing these results for moment of inertia of entire section :—

$$\frac{fI}{c} = \frac{fk}{c}\left[\frac{t''^3}{12} + td'^2 + \frac{nt''^3}{18} + nt''d''^2 + \frac{(2n+1)\ t'^3}{12} + (2n+1)\ t'd'''^2\right] =$$

resistance moment of fracture section of a plate with thick edges $= t'$. (8)

(To be continued.)

MODERN COLD STORAGE AND REFRIGERATION.

By W. S. DOUGLAS, B.Sc.

XX.—THE COOLING OF AIR SUPPLIES.

TO those who have much to do with the design of buildings where human beings are to live or congregate, a dissertation on the huge importance of a proper air supply will be superfluous. Suffice it to say that such a supply is beyond doubt an absolute essential, and that, at the same time, in spite of the labour and research which have been applied to the question, it remains a problem only partially solved.

Curiously enough, in all the systems which have been elaborated, and in all the experiments which have been conducted, very little attention indeed has been paid to cooling. Ample provision is always made for heating and for ventilation, and even for moisture absorption; but only in rare cases has cooling apparatus been thought of. This scarcely seems right, for if people must have air warmed in winter to 60° Fahr., surely it is equally important that the same temperature, or one not very much higher, should be produced in the hot days of summer. Perhaps the discomfort caused by atmospheric conditions is not quite so great in the latter case; but, at least in luxurious establishments, it is quite sufficient to make a cooling plant a distinct alleviation. To show how such a plant can be put in at the minimum expense is the purpose of the present article.

The problem of cooling the air would be a comparatively simple one were only the air itself to be considered. Unfortunately, however, we have also the moisture contained in it to deal with, and the result is that the work thrown on to the freezing machine is practically doubled. The reason for this is that only certain well-ascertained degrees of humidity are suited to our physical comfort. Accordingly care must be taken when effecting a change of temperature to keep within these specified limits. This always involves, when the air is being cooled, condensation of the moisture and consequent extraction of latent heat therefrom.

Why this is so will be known to those who have studied the science of ventilation; but a brief investigation (and recapitulation of what has been said before about the air in ice-chambers) before proceeding further may not be out of place. Air, as we know, is always charged with moisture in the form of vapour. On some days it is more heavily charged than on others; but at any given temperature it has a certain maximum capacity which cannot be exceeded, any surplus being condensed into water drops. The said capacity will vary, being greater at higher temperatures; in fact at 68° Fahr. it is twice as much as it is at 47° Fahr. Now this means that if we heat air at 47° Fahr. which is carrying its maximum charge (said to be "saturated") up to 68° Fahr., no moisture being added or subtracted, it will then contain only half what it might do were it charged to its full capacity at the latter temperature. But, of course, if water were left in contact with the air during this change, it would pick up sufficient as it became heated to render it saturated at all the temperatures it passed through; and finally, when it reached 68° Fahr., it would contain double the percentage of moisture it started with. Air at any temperature, in fact, will always pick up enough water, if it can, to bring its charge to the maximum.

Consider now what happens when we reverse operations. If air at 68° Fahr. saturated with moisture is cooled to 47° Fahr., it is obvious that, since its carrying capacity is reduced to one half, half its moisture would have been condensed, although actually it is still saturated. Similarly, whenever the temperature of air is reduced to such an extent that the amount of moisture it contains is more than sufficient to cause saturation, condensation will take place. This is the whole seat of the trouble in cooling air supplies.

Air can be cooled in two ways—with water only, or with water aided by refrigerated brine. In the first case no refrigerating machine is required, and under certain cases the system can be recommended. Usually, however, for large public buildings it is insufficient, although Dr. Stetefeld, a well-known German authority, has claimed that it must always be superior to schemes which involve the help of the freezing machine. This contention is, however, not supported either by conclusive figures or by practical experience, and in the calculations which follow, it will be proved that in most cases the refrigerating machine is essential.

The only economical method of water cooling is by evaporation. Water in a finely divided spray is mixed with the air to be cooled, which is supposed not to be saturated, and the result is that evaporation of the water takes place until all the air passing through is fully charged. As we have seen before, water has a very high latent heat of evaporation, and as this must come from somewhere before the water can be turned into vapour, it is extracted from the nearest source, namely, the air. Consequently the air is cooled in proportion to the amount of moisture it absorbs.

Very little water is used, owing to the large cooling effect which each pound produces, due to its high latent heat. From this point of view the system is good, but on looking into it closely we find that only in certain favourable circumstances can it work at all. For instance, were the air to be cooled saturated (as it might be in stormy weather) it would be perfectly useless. No more moisture could be carried by the air, and there would accordingly be no evaporation, with the result that no cooling would take place and the air would simply pass through the cooling apparatus with temperature unchanged, beyond, of course, the very slight effect produced by surface contact with the spraying water. This, owing to the small surface area, would be inappreciable.

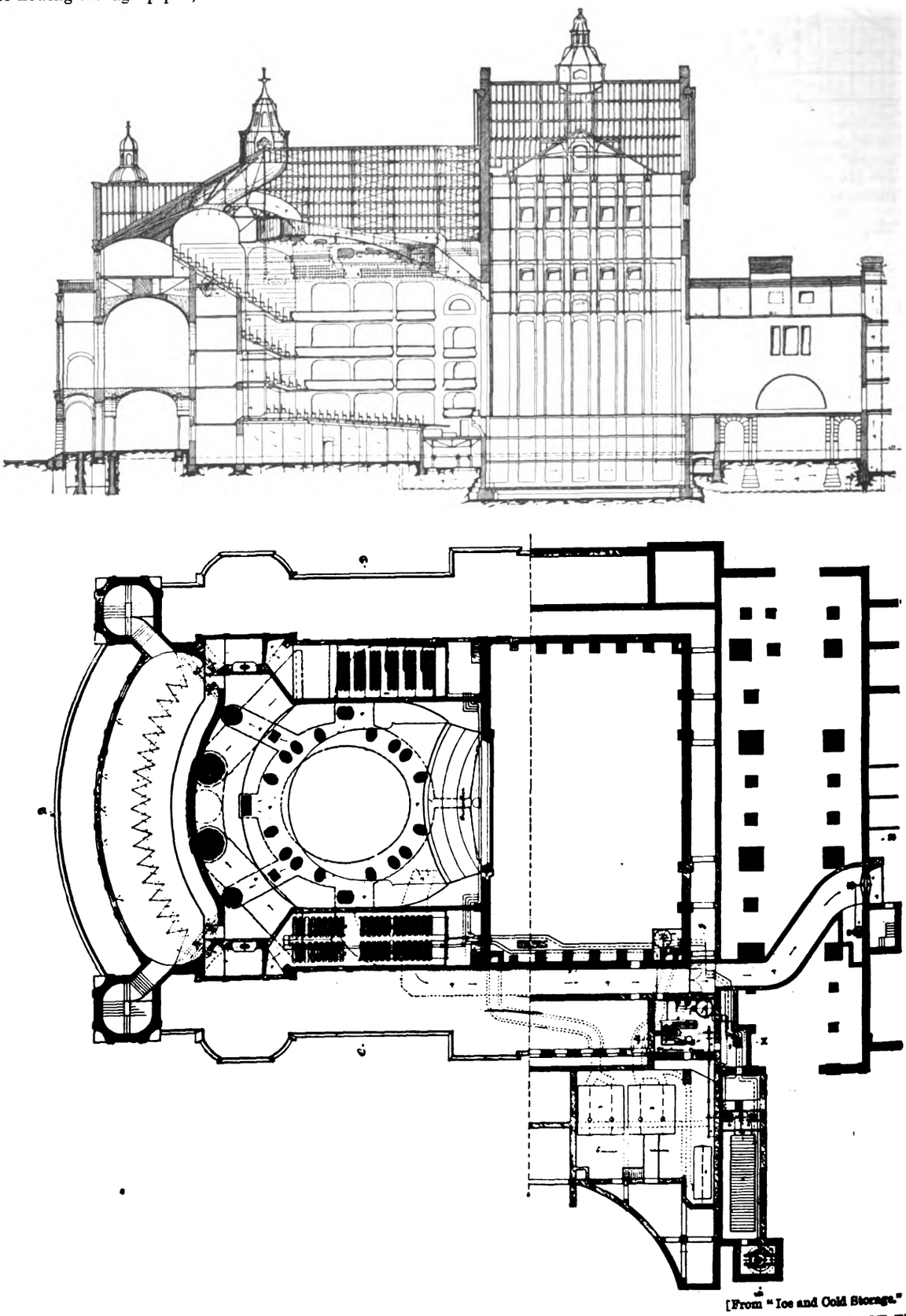
Hence unless the air is fairly dry no good results can be obtained, and even under favourable conditions the air must enter the building at very nearly saturation point (having absorbed sufficient moisture to cool itself). The

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result is that physical discomfort is caused, and, in the case of a theatre or concert hall, the pitch of the stringed instruments is harmfully affected.

The alternative is to cool the air by surface contact with water flowing through pipes; but to this scheme there is the fatal objection that the water consumed is enormous, since we depend not on the latent heat of evaporation but simply on the heat absorbed in heating the water in the pipes by a few degrees. It is also increased by the fact that we have not only to cool the air itself, but to condense the surplus moisture which appears as the temperature is reduced. In addition, since the air must be cooled to nearly the temperature of the water, a very large cooling surface is required, which involves an expensive plant.

Actual figures for an installation of the evaporative type at the Deutsche Bank, Berlin, were published by Dr. Stetefeld: 57,200 cubic feet of air per minute are drawn into the building by a fan, 12 feet 6 inches in diameter, which is driven by a 4-h.p. electric motor capable of speed variation to suit requirements. Leaving the fan, the air is



[From "Ice and Cold Storage."

FIG. 62.—REFRIGERATION AT THE COLOGNE MUNICIPAL THEATRE.—GROUND PLAN AND SECTION A—B OF THE THEATRE SHOWING STAGE, AUDITORIUM AND MACHINERY ROOM.

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passed either through a heating chamber or a cooling chamber according to the season, and is finally discharged into the building. The cooling chamber contains twenty cast-iron flanged plates over which the water trickles, being broken up in its passage into easily vaporisable particles. All the plates together have a surface of 787 square yards, and break up 5,250 gallons of water per hour.

The cost of the heating and ventilating apparatus was 1,550*l.*; while the cooling chamber and circulating pump, without water service, cost an additional 250*l.* Power for the pump and fan comes to 10s. per eight-hours' day.

This is obviously an inexpensive plant to instal; but, as pointed out above, it is almost useless for saturated air. It is true there is always, even if there is no evaporation, a certain amount of cooling by surface contact, but its effect is small. The system cannot therefore be said, unless in Northern latitudes, to have perfect control over the condition of the air. Perfect control would mean that we are enabled by the cooling system which we adopt always to keep the air in the state pleasantest to the human frame, and such a state, it is found, will be attained if the temperature is about 68° Fahr. and the humidity in the neighbourhood of 60 per cent. (meaning that the air carries 60 per cent. of its maximum or saturation charge of moisture). For the maintenance of these conditions continuously no other system but cooling by refrigerating machine can be trusted.

The reason for this is that in order to condense the superfluous moisture the only practical method is to reduce the temperature of the air. An alternative would be to absorb the moisture in a hygroscopic substance—calcium chloride, for instance, or concentrated vitriol—but the expense of renewing the charges would be so enormous that the method, except on a small scale, is impracticable. The refrigerating machine, on the contrary, costs little to run.

To show what amount of cooling is necessary, the best plan will be to examine an actual installation and to see under what conditions it has to work. One of the best of these, and also one of the first, is that of the Cologne Theatre, in Germany, which was designed by the municipal engineer of that town. The theatre has seating accommodation for 500 in the gallery (which has a different supply of air to that in the stalls, circles, &c.), and 1,300 in the other parts of the house. Our problem, therefore, is to provide air at a reasonable humidity and a comfortable temperature for 1,800 persons.

The first point to settle is the amount of air per hour which it is intended to supply to each person, and with this is closely interlinked the question of humidity. How the two are connected it is not at first easy to see; but we must remember that in each part of the house a definite maximum temperature must not be exceeded; which in this case is 73.4° Fahr. (the equivalent of 23° C.) up in the gallery, and 68° Fahr. for the stalls and better seats. Now if less air is brought in, its temperature must be reduced to a lower value. Otherwise in its passage through the house it would be heated above the limit. Consequently, since the greater the temperature reduction the larger the condensation of moisture, more moisture is taken out of the air, and, when it reaches the higher temperature, after passing through the house, its percentage of humidity will be less. Similarly, if more air were passed through, such a low temperature would not be needed, as the air has not so much opportunity of being heated, and it follows that less moisture would be extracted, the humidity of the air at the final temperature being higher.

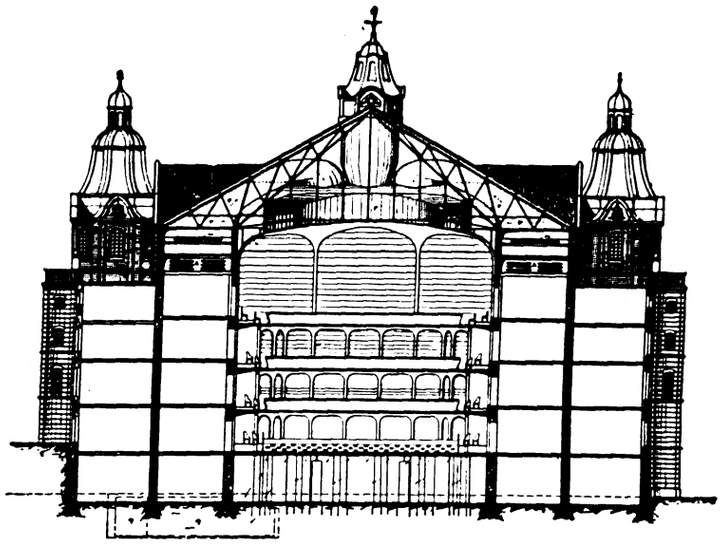
It is apparent from this that the quantity of air to be passed through will vary every day according to the atmospheric conditions, and consequently the fans, which are motor driven, should be made capable of a considerable range of speed. On days when the humidity is high the speed would be reduced, and similarly it would be raised if the weather were fairly dry. Taking the first conditions, it is assumed that we have air at 78.8° Fahr. and 70 per cent. humidity. This in the case of the Cologne Theatre is first cooled by surface contact with water tubes till its temperature is about 63.5° Fahr., some of the moisture being condensed, and is then passed over the cold brine coils, which are connected to the freezing machine. Initially it contains 7.31 grains of water vapour per cubic foot (being 70 per cent. of 10.44 grains, which corresponds to saturation at 78.8° Fahr.); but at 63.5° Fahr. saturation is caused by the presence of 6.55 grains. Consequently the surplus, or 0.76 grains per cubic foot, has been condensed.

We have now saturated air at 63.5° Fahr., which contains 6.55 grains moisture per cubic foot and must be cooled to such an extent that in its passage through the house its temperature does not rise above 68° Fahr. At the same time its state of humidity when it has risen to that temperature must not exceed 60 per cent.

Saturated air at 68° Fahr. we know would contain 7.53 grains of air per cubic foot, and hence the moisture contents per cubic foot for 60 per cent. humidity will be 4.52 lbs. This corresponds to saturation at 53.6° Fahr., and accordingly it is to that temperature at least that the air must be cooled. It therefore has to rise 14.4° Fahr. in its passage through the house, which will necessitate an absorption into each cubic foot of 0.28 B.T.U.'s.

Now each person it is found develops some 400 B.T.U.'s per hour. This means that he will cause the given rise of temperature in $\frac{400}{0.28}$ or 1428.6 cubic feet of air per hour, which gives us at once the displacement per person. The total displacement, therefore, for the better part of the house will be 1,300×1428.6, or 1,857,180 cubic feet.

In the gallery cooling is by the water pipes only, and the air, therefore, enters saturated, or nearly so, at 63.5° Fahr., leaving with 74 per cent. humidity or less at 73.4° Fahr. This is accomplished by providing a circulation of 2,120 cubic feet per hour per person. It is necessarily more rapid



[From "Ice and Cold Storage."

FIG. 63.—SECTION C-D OF COLOGNE MUNICIPAL THEATRE.

than the circulation in the stalls, since the temperature rise must be less, owing to the air entering at a higher temperature initially.

We come now to the determination of the size of the freezing machine. This was calculated in the following way:—

B.T.U.'s to cool one cubic foot of air from 63.5° Fahr. to 53.6° Fahr.

$$= 9.9 \times 0.0195 = 0.193.$$

B.T.U.'s absorbed in condensation of 2.03 grains of moisture per cubic foot

$$= \frac{2.03 \times 1080}{7000} = 0.313.$$

(1080 = latent heat at the average temperature of condensation).

Total B.T.U.'s per cubic foot = 0.506.

Total B.T.U.'s to be absorbed per hour

= 1,857,180 × 0.506 = 940,000 nearly.

A machine of such high capacity as this would naturally be expensive. Accordingly one having a capacity of only 200,000 B.T.U.'s was put in and a very large brine-storage tank was provided. The temperature of the brine in this tank, which forms the evaporator, is gradually reduced by running the machine during the day, and the result is that at night a large accumulation of "cold" is available, which is distributed by circulating the brine through the cooling tubes.

Figs. 62 and 63 (from *Ice and Cold Storage*) show sectional views of the theatre, on which the freezing machinery, cooling chambers, and ducts are indicated. Air is sucked in through filters by two Blackman fans, each 6 feet 6 inches in diameter, and is then passed over the water tubes, which

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are seen together with the brine pipes in the plan view (fig. 61). Leaving these, that part which is destined for the gallery is taken off to the roof in two straight ducts, one from each cooling chamber, and is exhausted from under the seats to the main exhaust duct which runs underneath the theatre. Cold water for the coils is circulated from the well in the bottom right-hand corner of the plan view by a steam-driven pump.

The air for the better seats is passed over the brine tubes and is then impelled through the circular duct, seen in the middle of the plan view, to the various openings over the auditorium. It leaves these with a velocity of only 1.64 feet per second, which is sufficiently low to obviate the danger of draughts.

For exhaust purposes there is an opening under each seat, controlled by a slide which can be regulated by the occupant, and of such a size that when full open the velocity of the air through it is only 1.17 foot per second. Leaving these openings the air is collected and taken to the exhaust duct, which is seen between the engine-room and the stage. It is then discharged into the atmosphere by a third Blackman fan, which, like the others, is 6 feet 6 inches in diameter. In this way (with exhaust from beneath the seats) no germs or dust are blown into the house.

The refrigerating machinery is on the ammonia compression system, by Humboldt's of Kalk. It includes a compressor, driven by a direct coupled steam engine, a submerged condenser and a brine-storage tank with ice-making apparatus, forming the evaporator. There is also a complete equipment of pumps for circulating brine and cooling water and for extracting air from the steam condenser. The brine tank is seen close to the well towards the stage.

The air-cooling chambers, being above the auditorium, have been very carefully made watertight with sheet lead and asphalte; and the ducts, together with the chambers, are all insulated with slabs of cork board.

To deal with exceptionally moist weather an arrangement has been made whereby the air, after having been cooled to an extra low temperature so that the moisture may be extracted, can be heated in order to prevent the temperature in the auditorium from rising above the limit. This arrangement forms part of the ordinary heating apparatus, which is so placed that in winter the air, instead of passing over the cooling coils, can be made by damper regulation to go through the heating chamber. The same distributing duct and fans can therefore be used for both systems, which fact forms a strong argument for the adoption, in buildings of this class, of freezing machinery.

Control of the system is peculiarly easy, as long-distance thermometers are connected from all the sitting accommodation and ducts to the engineer's room.

(To be continued.)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) illustrates a competition design by Mr. Marcus T. Reynolds for a manual training school for the Troy Orphan Asylum, and three "Classic" houses by Mr. Oswald C. Hering, Messrs. Carrère & Hastings, and Mr. J. Foster Warner respectively.

La Construction Moderne (Paris) has illustrated in the past two weeks a large furniture manufactory at Pantin, designed by M. E. Jacquin, and the new Regatta Clubhouse of Havre at Saint-Adresse, of which the late M. Daniel was the architect. In its series of articles on old Paris our contemporary now deals with the seventeenth-century houses of Nesmond and the Miramiones.

Arkitektur og Dekorativ-Kunst (Christiania) has an illustrated descriptive article on the buildings of the recent exhibition at Bergen.

Construction (Toronto) devotes a considerable portion of its space this month to illustrations of the loan exhibit of architectural drawings by the Ontario Association of Architects in the Applied Arts Building at the Canadian National Exhibition. This fairly represents the development of architecture in Canada and its recent achievements. It also includes several examples of contemporary English architecture.

Het Huis (Amsterdam) continues its series of articles on Old Deventer, with illustrations of its wealth of old houses and churches. There is also an illustrated article on the Castle at Warmond. A design for a country house at Baarn is illustrated by photographs of a model which includes the building and terrain.

Moderne Bauformen (Stuttgart) makes a special feature this month of the work of Dr. Schulze-Kolbitz, of Berlin; of Professor Jan Kobera, of Prague; and of Heinrich Bomhoff, of Hamburg, of each of whom an appreciation is given together with illustrations of their designs. Several of Professor Alfred Grenander's interiors are shown, and a variety of other architects' works, chiefly domestic.

Zodtchy (St. Petersburg) continues its account of garden cities, the German Ratshof being now dealt with, and a short summary of Swiss and American instances included.

Engineering Record (New York) has an account, with illustrations, of the grand stand at the American League Baseball Park in Chicago, which is a fireproof, steel, reinforced concrete and brick structure with a total seating capacity for 31,500 persons.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Lighting of London.

SIR,—You had a letter in your issue of September 16, from the Publicity Committee of the Electric Lighting Companies, which was in the nature of a defence against the Gas Companies as instanced by the progressive policy evidently of the Gas Light and Coke Co. Before I write further on the subject it will be better perhaps for me to state most emphatically that I *hold no shares in any gas or electric company*; my letter will therefore not be open to any suggestion of prejudice. The gas companies for many years were most disobliging and discourteous, latterly this attitude has been entirely reversed, with the result that to-day they evidence the fact that architects and builders may receive from them every possible assistance. This has been proved to me in more than one instance during the last twelve months, both in the West End and in the North of London. I wish, sir, I could write in the same strain with reference to the various electric lighting undertakings. Here every difficulty is placed in the consumers' way, and in several cases incivility can be complained of. The manufacturers also are much to blame. With the advent of metal filament lamps electric lighting has undoubtedly been much improved, but the delay in getting these lamps supplied has been in cases irritating to clients, and most annoying to the architect. I trust that there is no truth in the rumour which I heard not long since that one of the electric supply companies had suggested that in consequence of the new lamps that are being introduced they were considering the advisability of raising the cost of current. A suicidal policy of this nature would be final. Gas would triumph over electricity, and with the new systems of lighting in vogue I am not sure that electricity will not be found (for lighting purposes) on the downward grade.

Apologising for the length of my letter, I am, yours truly,

AN ARCHITECT.

London, S.E.: September 27, 1910.

A CARVED-OAK reredos was recently unveiled in Chichester Cathedral. The reredos was designed by Mr. Somers Clarke, the cathedral architect. Its principal figure is that of Christ upon the cross with angels in adoration. Panels contain figures of St. Richard of Chichester and St. Peter, St. Stephen, and St. Nicholas.

THE latest industrial development along the banks of the Manchester Ship Canal is the proposed erection of extensive iron and steel works at Irlam, on a site which covers 90 acres, and has been purchased from the Ship Canal Company. The works are to be erected by a new registered company. The works will take about two and a half years to build, and when completed they will employ from 1,000 to 1,500 workpeople.

THE Bishop of Durham has recently consecrated the new church of St. Oswin, South Shields, which has been erected in the recently formed parish of Brinkburn, a district between Westoe and Tyne Dock. Occupying a site, one acre in extent, in Stanhope Road, the edifice at present consists only of three bays and the nave, with seating accommodation for 320 people. The cost has been 3,400*l*. When funds permit, the nave will be completed, and choir and clergy vestries added. Accommodation will then be provided for over 500 persons. Mr. Henry Grieves, A.R.I.B.A., South Shields, is the architect, and the building contract has been carried out by Mr. James Young, of Tyne Dock.

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The Architect.

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FORTHCOMING EVENTS.

Monday, October 10.

Royal Institute of British Architects : Town Planning Conference ; October 10-15.

Architectural Association : Annual General Meeting. President's address and distribution of prizes.

International Town Planning Exhibition (in connection with the R.I.B.A. Conference) opens at the Royal Academy Galleries ; October 10-22.

Society of Engineers : First of a series of six lectures arranged by the Society of Engineers (Incorporated) and the Junior Institution of Engineers on "The Law Relating to Engineering," at Caxton Hall, by Mr. L. W. Costello, M.A., LL.B.

Thursday, October 13.

Society of Architects : Twenty-sixth Annual General Meeting.

King's College, London : Mr. A. Stratton, A.R.I.B.A., begins a course of lectures on "The Principles of English Architecture from the Fifteenth to the Eighteenth Centuries, and on Contemporary Work in Italy and France."

Friday, October 14.

Glasgow Technical College Architectural Craftsmen's Society : President's Address, by Mr. John Bowman.

ROMANESQUE ARCHITECTURE.—I.

OF all the many styles, or rather periods of development, in architecture that make up the history of the art there is scarcely one that contains more of interest as well as of difficulty than the epoch comprised under the term of Romanesque. One of the first difficulties is to define what we mean by Romanesque, and, as Miss Edith A. Browne says in a charming little book* that professes to be written specially for the instruction and guidance of amateur students of architecture, "it is by no means easy to make up our minds what is the best name to give to a style of architecture belonging to a period which happens to combine the decay of a great political power with the growth of a great religious power."

We must start from the point that at the beginning of the fourth century Roman classic architecture became subject to three powerful influences: (*a*) Religious, (*b*) political, (*c*) racial. Miss Browne, in explaining to her readers the influence of Christianity on the later development of Roman architecture, rightly emphasises the fact that the earliest Christian churches, prior to A.D. 300, were far more influenced by Eastern thought than by classic Roman tradition. The seedlings of Byzantine rather than of Romanesque were the first culture of Christianity in architecture. Hence Romanesque can only be recognised as commencing with the religious influence of Christianity on Roman classic architecture in the fourth century. We must, however, remember that, apart from any such influence, Roman architecture was *proprio motu* advancing to that point of development in which the arch was to be dominant rather than on equal terms with the orders. This point we see exemplified in the palace of Diocletian at Spalato and in the temples of Palmyra and Baalbec, and it is an interesting speculation whether Roman architecture might not have reached some phase very nearly, if not entirely, similar to that seen in Romanesque work independently of any Christian or other religious influence.

There is one point in connection with the plan of early Christian churches—the difference in prevalent type in the Eastern or Byzantine from that in the Western or Romanesque buildings—the reason for which is very generally ignored or insufficiently explained. Why should the parallelogram or basilican form be adopted in the West, and the central area, circular or polygonal, in the East? It cannot be correct to ascribe the preference to constructive reasons. Construction does not dictate plan arrangement, but follows it. The basilican plan led to the construction of the vault, the central area to that of the dome.

We may find the clue to the mystery in the baptisteries of Western Christendom. The rite of baptism was and always has been, down to the present day, part of the ceremony of admission to the body or society of the Christian Church, and the actual baptism follows, and is an acknowledgment of the profession of specific vows taken by the candidate in the presence of an assemblage of members. Hence the suitability of a central area, in the midst of which the candidate can stand surrounded by the witnesses of his vows, and therefore the persistence of this type of plan in the baptisteries. This we believe to be the true reason for the adoption of the circular form of church by the Knights Templars rather than a fancied reminiscence of the Church of the Holy Sepulchre at Jerusalem, as is very generally supposed.

In the early days of Christianity the community of its adherents was necessarily very much of a secret society, and it was of the highest importance that everyone admitted should know and be known by the members, and should realise that the necessary vows imposed as a condition of admission were witnessed by those already members. Now we have already seen that the earliest Christian churches were those of the East, and therefore in the East the central area type of plan became established as normal when the ceremony of admission by baptism was of more importance to the existence of the Christian community than was any particular liturgical disposition. It is worthy of note that the earliest Eastern or Byzantine churches have pure central area plans, as St. George, Salonica; St. Sergius, Constantinople, and the Kutchuk Aya, Sofia, and that it is only later that the plan becomes an agglomeration of dome-surmounted squares. The central area is also to be found in such early Western examples as St. Maria, Nocera, and St. Donato, Zara.

The basilican type of plan, on the other hand, was contemporaneous with the existence of a Christian community enjoying Imperial favour, and the whole plan of a Romanesque or Western basilican church is consonant with the idea of such a community, to which the privilege of admission was granted as a favour; the atrium, for intendants; the narthex, for the probationers or catechumens; the nave, for the faithful; the presbytery and apse, for the ministrants and celebrants.

In connection with the basilican type of plan there is one error, a somewhat common one, in Miss Browne's book that, for the sake of her amateur readers, we hope to see corrected in a future edition. She says: "Some of the Roman temples were converted into churches, as also

* *Romanesque Architecture.* By Edith A. Browne. (London: Adam & Charles Black. 3*s.* 6*d.*)

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were many of the Roman basilicas." There is, we believe, no single well-authenticated instance of such conversion, save the use of the material of pagan buildings, columns, and other architectural features for the construction of Christian churches. Nor, in the face of the strong aversion to anything connected with pagan worship that is evidenced by such passages as Acts xv. 29, 1 Corinthians viii. 10, 1 Corinthians x. 28, and Revelations ii. 14, 20, is it to be conceived possible that either pagan temples or pagan basilicas, in which was always an altar, on which witnesses took their oath, could be converted into Christian churches. It cannot be said that the passages of the New Testament to which we have referred convey only the opinions current in early days of the Christian Church, for the Scriptures as we now have them, subject to slight variations of transcription and translation, were approved by the Council of Carthage in A.D. 397, and contain, therefore, the views of the Christian Church at the time when the basilican type of building was in full vogue.

The chief political influence that tended to the modification of Roman architecture was, of course, the establishment of the centre of government by Constantine in Byzantium, and as such is closely connected with the racial influence which differentiated the course of development by the action of Eastern and Greek ideas at Byzantium and by those of the northern invaders in Italy.

In a book intended for amateur readers it is perhaps well not to go too deeply into detail; hence we find that Miss Browne does not pursue the subject of the development of detail to any full extent, but devotes her attention to the important functional matters of the vault and the dome as distinctive of the racial divergence of East and West. We think, however, she might have explained the essential difference between the Classic and Gothic methods of moulding, and have pointed out how in this direction Romanesque forms a connecting-link between the two epochs. It is perhaps not easy to convey to the lay mind the meaning of moulding, but Miss Browne has such an admirable ability in explanation comprehensible to the amateur that we should have liked to see her essay the task.

We are glad to find that our author lays stress on the legitimate claim of the Romanesque builders to be considered as exponents of beauty in architecture, and gives them due credit for their treatment of proportion, perspective, line, and mass. The place filled by Romanesque sculpture as an element of the ornamentation of their buildings is also well explained.

Forty-eight excellent photographs, very well reproduced to full-page size, fully justify the ascription of beauty to Romanesque architecture, particularly as they are mostly selected from examples of its full development not only in Italy, but in Germany, France, and Spain.

By the courtesy of the publishers, Messrs. Adam & Charles Black, we are able to reproduce two of these illustrations.



TORO CATHEDRAL, SPAIN. [From *Romanesque Architecture*

"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

WE seem to have set, for September, a subject that has been found too difficult by the majority of the members of the Sketching and Measuring Club. We were quite aware that it was a difficult subject. It is not easy to translate into a pen-and-ink drawing, to a large scale, the variation of light and shade that is to be found in a piece of architectural carved ornament, but just because it is difficult, it is an excellent study and trains the mind in the most valuable of all faculties in the practice of representation or draughtsmanship, the power of right selection.

The lesson cannot be too frequently or too forcibly impressed that when we attempt to represent anything in a drawing we cannot draw it as it is or even as it looks without limitation. A drawing is not a photograph. We must, therefore, limit our attempt to suggestion and in a pen-and-ink drawing eliminate unsparingly everything that is not necessary to a full and correct suggestion or expression.

"Loidis" has drawn a vaulting boss from St. Mary's Abbey, York, which is a fine and spirited piece of mediæval carving representing two dragons engaged in combat. The drawing is well executed, sufficiently eliminative, and at the same time suggestive.

"Sans Peur" sends a drawing of carving from a spandrel of the arcading of the north porch of Wells Cathedral. His drawing is delicately suggestive, but too

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much has been eliminated, so that, although a pretty drawing, it does not fully express the character of the work delineated.

We have awarded the prize for September to "Loidis."

As we find that there is often but a small difference in merit between the drawings that we consider the best and those that most nearly approach them, we have decided to reserve the power to divide the prize each month between not more than three of the competitors. We hope that this will also encourage some who may feel that although they may not be quite able to reach the first place they are capable of getting within measureable distance.

NOTES AND COMMENTS.

Whatever views may be held of the conclusions to which Professor Goodyear has come with regard to the cause or intention of the abnormalities in setting out of the many ancient buildings he has investigated, there can, we think, be no question as to his competence as an accurate measurer and critic of measurements. We are glad, therefore, to learn from the article that appears in the *American Architect* of September 28, a synopsis of which we give elsewhere, that he has come to the conclusion that the inclination of the Leaning Tower of Pisa has been inaccurately estimated by the Italian Commission of this year, and that the fears of the whole world as to the safety of the Tower have therefore been needlessly excited.

We commence this week a series of articles on Petrol Air-gas Lighting, which will appear at fortnightly intervals, and will, we believe, be found useful to many of our readers as an introduction to the newest form of lighting, which has many advantages, particularly where gas or electricity cannot be obtained from a central supply station, and of which architects, as a body, have not yet had much opportunity of making a study.

The Secretary-General of the R.I.B.A. Town Planning Conference has, in one particular, blundered or failed, even with the help of numerous committees and a hard-worked staff. The middle of the week before the opening of the Congress has arrived, and members who have sent in their guineas are complaining that they have not even received a time-table to tell them what is to happen each day. This is particularly hard on provincial architects who have to make special arrangements to leave their work and come up to town.

There are thousands of architects who do not care a straw about the Town Planning Conference; hence it is important that the organisers should do their best, indeed, better than the best they have done, to attract not only the enthusiasts, who are few, but the waverers, the men who are hesitating as to whether they can afford the time or the money to attend the Conference. It is absurd to adopt the standpoint of a Berlin police president and expect every architect to send in his guinea and wait humbly till the last moment before he is allowed to know whether the definite programme and time-table are such as will fit in with his business arrangements. It is somewhat cynical to fix the dates of the excursions and keep the profession in the dark as to the times of the serious proceedings. This is not the way to make a success of the Conference, and from what we hear the attendance will be several hundreds less than it would have been if the time-table had been issued even a fortnight ago.



WORMS CATHEDRAL, GERMANY. [From *Romanesque Architecture.*

The case of Kennard *v.* Rodwell, which we report elsewhere, shows that it is possible to prove infringement of copyright in an architect's design, and so removes the objection that some practitioners have urged, that an extension of the present law of copyright to architecture would be valueless by reason of the impracticability of proving infringement. At the same time the case shows us that, even at present, the law recognises that an architect has some property in the productions of his brain, and with business-like methods can, to some extent, at least, protect that property.

In a letter to the *Times* Mr. R. H. Forster describes the recent excavations on the site of the Roman Corstopitum at Corbridge, the most important feature of which has been the exploration of the eastern half of the Forum, the western half of which was excavated in 1908. In

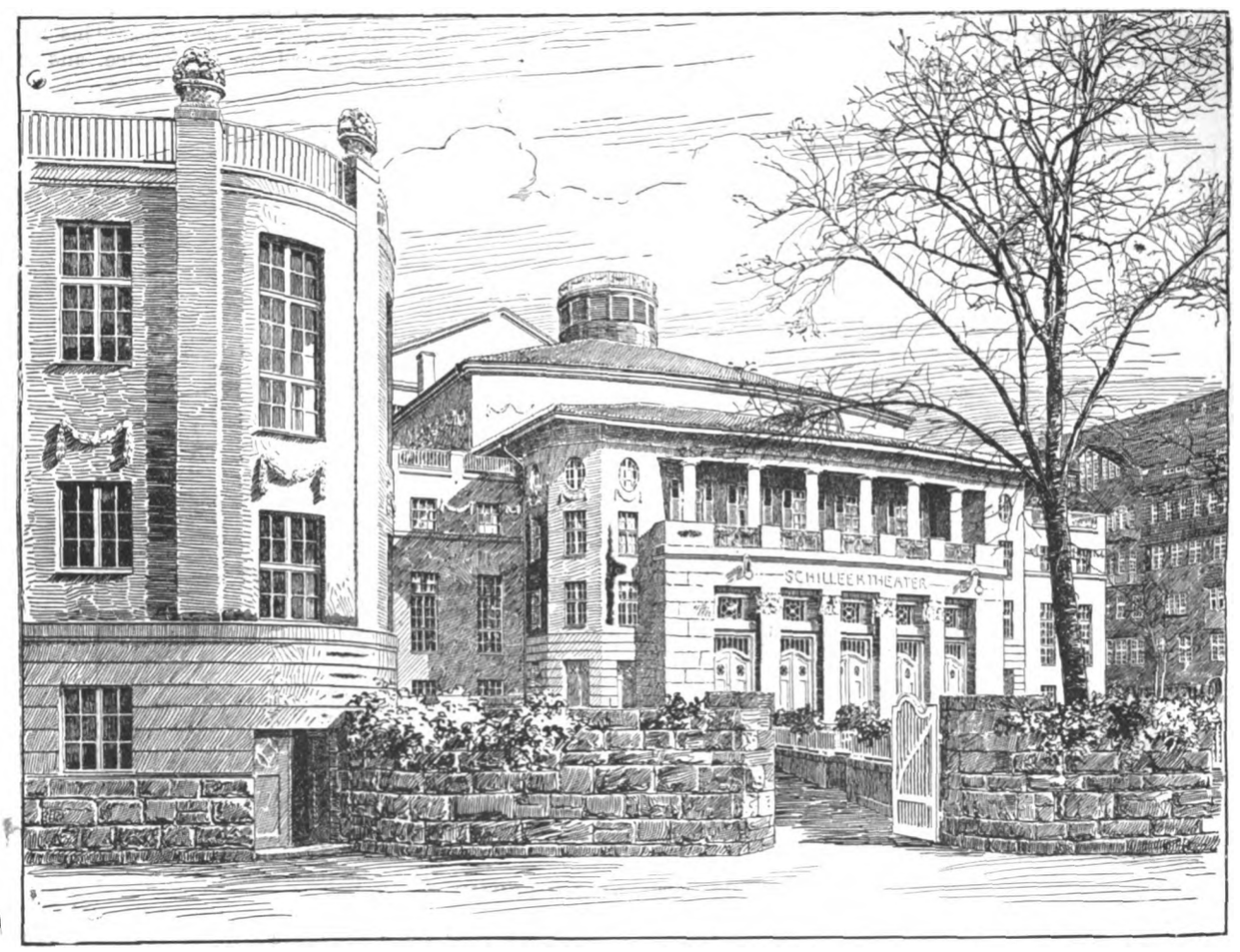
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the course of the excavations a fine Roman altar has just been brought to light, dedicated to Jupiter Dolichenus, Caelestis Brigantia, and (probably) the Salus Augusti.

A meeting has been held in Aberdeen for the purpose of ascertaining the opinion of the diocese regarding the proposal to establish a cathedral church in the city. The clergy and vestries of the various Episcopal churches in Aberdeen and suburbs recently decided that a cathedral was desirable for the unification and more efficient working of the diocese, and the cost was estimated at about 30,000*l*. Bishop Ellis, who presided, said that to prevent confusing the issue before them, he had considered the matter very carefully, and did not see his way to raise any of the existing churches to the status of a cathedral. Most of those he had communicated with were of opinion that if they were to have a cathedral at all in Aberdeen, it should be a new building, worthy of the diocese, and if on the site of an existing church, so much the better. If they were not to take steps that day for the erection of a worthy cathedral, then, in his opinion, it was better for them to wait. They had waited so far, and it was better to wait a few years longer than to set up what might be called a pro-cathedral. After considerable discussion, the meeting was unanimously of opinion that the principle of a cathedral should be accepted, but that a committee be appointed to inquire into the question in all its bearings, and report to a future meeting.

Few architects, probably, have ever made a design which, at a later period, they have not felt they could improve, and we are therefore not surprised to learn that Mr. G. Gilbert Scott, who is now not quite so young as when he won the competition for Liverpool Cathedral, has, in the maturing of his artistic powers, felt that he could improve on his original conception. He is fortunate to possess the boldness to suggest this improvement to the Executive Committee, and still more to meet with a favourable reception to his suggestion for providing a larger central space and a great central tower.

The Dean of Salisbury in his address at the opening of the winter session of University College Hospital enunciated a sound principle when he recommended to medical students some attention to architecture, painting, sculpture, music, and poetry for the refreshment and enlargement of their mental life. Conversely, if he were to address a meeting of art students we opine that he would recommend excursions into realms of science. Herein lies one of the dominant characteristics of the calling of an architect. It necessarily demands that the student who would be a complete architect must take care that his mental equipment is of the widest nature. He must, above all things, avoid narrowness of view, and in those who are in the forefront of architecture to-day we find that there is a keen appreciation of many other things besides artistic design. Our best architects are such not because they are artists, but because they are also practical, scientific, and business men. The architect who prides himself on being an artist or a practical man or a scientific expert is never wholly a success. The architect, therefore, is fortunate in that within the limits of his own calling he has the opportunity for the desirable refreshment and enlargement of his mental life.



THE SCHILLER THEATRE, BERLIN (CHARLOTTENBURG).—GENERAL VIEW OF BUILDING.

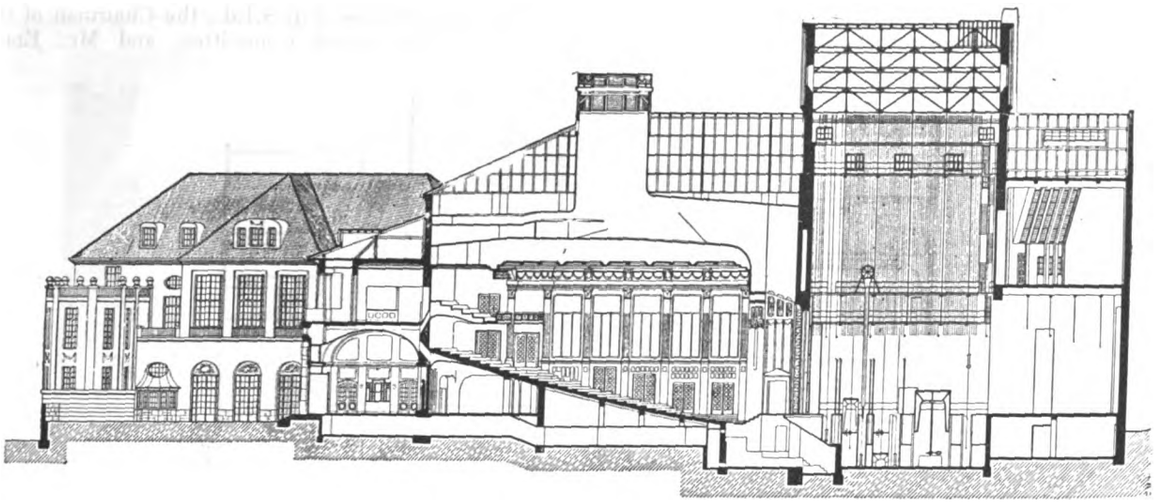
Whilst we are having our Town Planning Conference at the R.I.B.A. next week, the "Congrès International d'Art Public" will be held at Brussels, dealing in one section with town-planning, construction, and decoration, the others being the preservation of ancient monuments and works of art, and education of the public in the principles of art as well as in its technicalities.

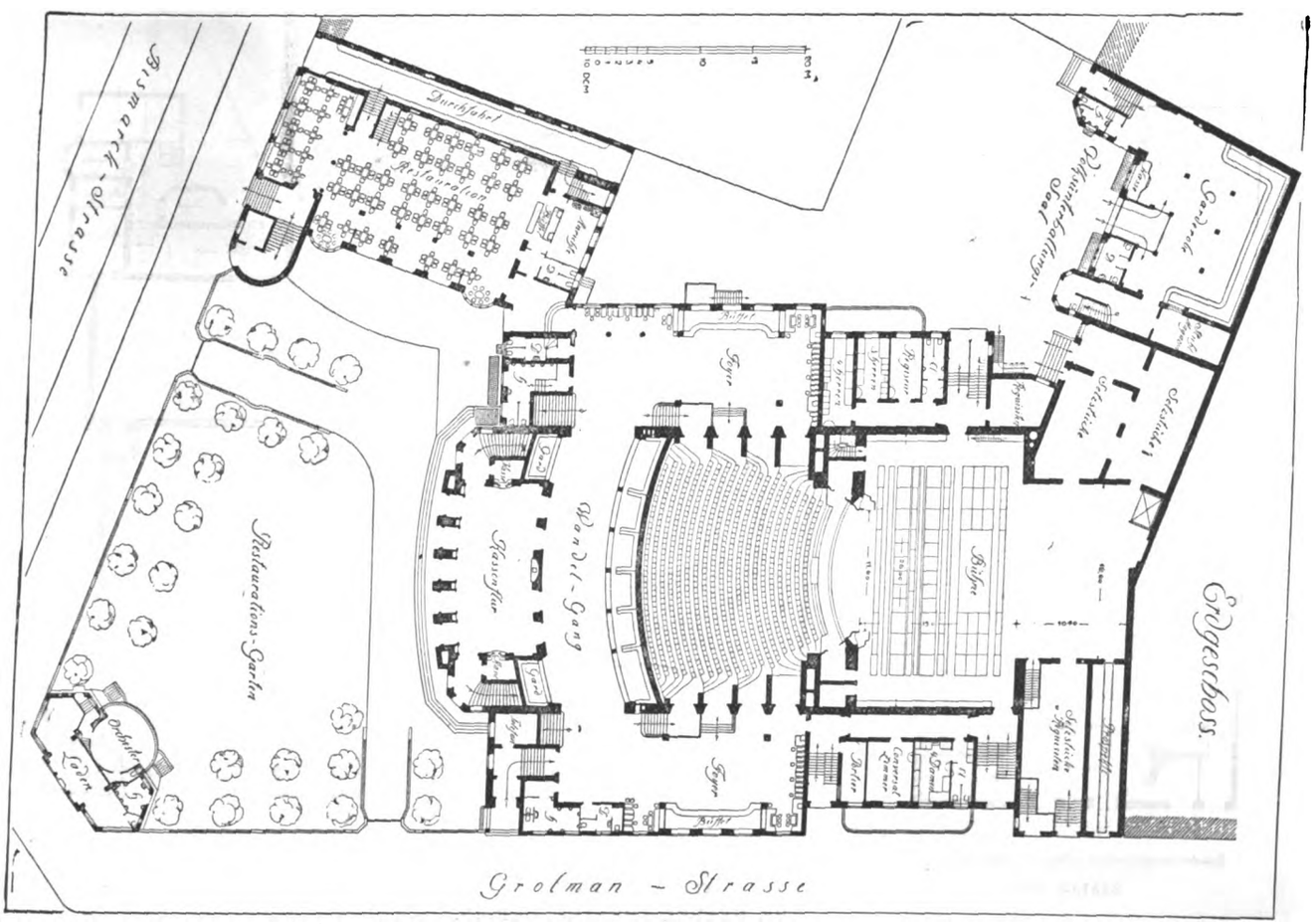
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The competition, of which particulars appear in our advertisement columns, for the laying-out of the grounds of Villa Marina, Douglas, Isle of Man, and for the erection of certain buildings therein, shows a right appreciation of what should be offered as premiums when, as in this case, the promoters desire only to select a design, and not an architect. The first premium is 1¼ per cent. on the proposed outlay, and there are two other prizes offered

THE BRITISH FIRE PREVENTION COMMITTEE ON TOUR.

In addition to the valuable work done by the Executive of the British Fire Prevention Committee in carrying out tests with materials and various forms of construction, they have on several occasions organised "Special Commissions" or parties of the Executive to visit specific parts of the Continent of Europe and gather information,





THE SCHILLER THEATRE, BERLIN (CHARLOTTENBURG).—GROUND PLAN AND LONGITUDINAL SECTION.
Typical "Bayreuth" plan, with one small balcony tier only.

of half the amount. Whether it is wise to obtain designs and not an architect in this way is another question, but, at any rate, it is a very common practice in Germany. We regret to note that the promoters have not as yet recognised the importance attached by British architects to the appointment of an assessor. In this respect the Manxmen have not followed the universal practice in Germany.

more particularly as regards fire-service and fire-prevention methods, but also of matters of quite general architectural interest, which are afterwards incorporated in "records."

The latest of these "records" just published gives an account of a visit to Berlin, Hamburg, and Hanover on the occasion of a meeting of the German Professional Fire Service Association at Hamburg in 1909. As an

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earnest of the useful information collected by these Special Commissions, we note that as a result of this last visit certain particulars and suggestions as to petrol storage and safety devices were accepted as evidence by the Home Office Departmental Committee on Petroleum Spirit (1909-10), and published in Vol. I. of the Minutes of Evidence, Cd. 5176.

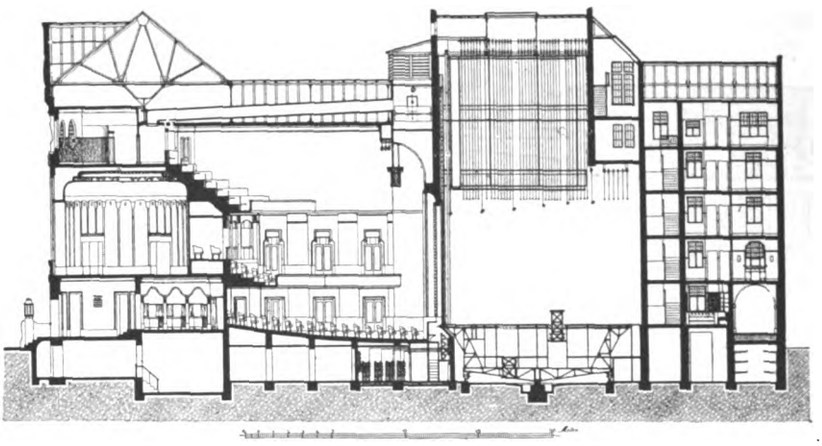
Quite instructive are the " impressions " of the Commission on many matters concerned with fire-prevention and fire-fighting, in which the Continental methods are criticised and compared with British, and the criticism and comparison are not always or necessarily laudatory of German methods and regulations.

The " record " before us contains a critical description of the fire brigades of Hanover, Berlin, and Hamburg, their organisation, housing, equipment, drill, and methods. We have also notes on some recent typical fires in Berlin and of special classes of fire-risks, such as petrol storage, and large shops or stores, showing how in Berlin provision is made for anticipating the outbreak of fires of the nature of those of which we have had recent sad experience in England.

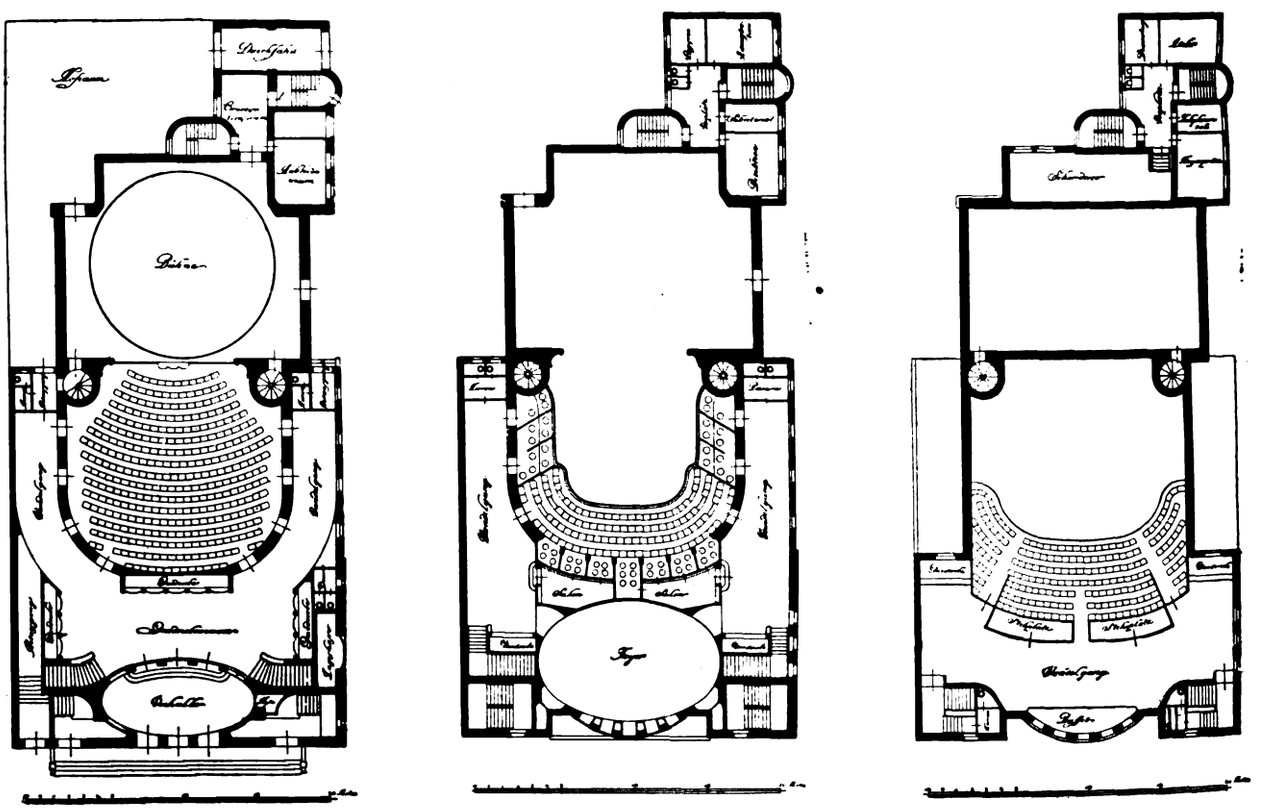
Useful information is included of more general architectural value on other classes of buildings, primary and secondary schools, hospitals and theatres, some of the illustrations of which we are permitted, by the courtesy of the British Fire Prevention Committee, to reproduce.

An admirable article on fire-resisting construction in the warehouse district of the free port of Hamburg, by Mr. Edwin O. Sachs, F.R.S.Ed., the Chairman of the British Fire Prevention Committee, and Mr. Ellis Marsland, the general honorary secretary, is most instructive as to the errors that were formerly made and the gradual steps in the progress towards improvement.

The members of the Commission seem to have been most cordially welcomed in Germany and to have had a real good time, which we must admit is no more than they deserve for the value of the information they have brought home without expending the funds of the Committee, as the members of the Commission, we happen to know, defray their own expenses.



LONGITUDINAL SECTION.



STALLS PLAN. FIRST TIER PLAN. SECOND TIER PLAN.

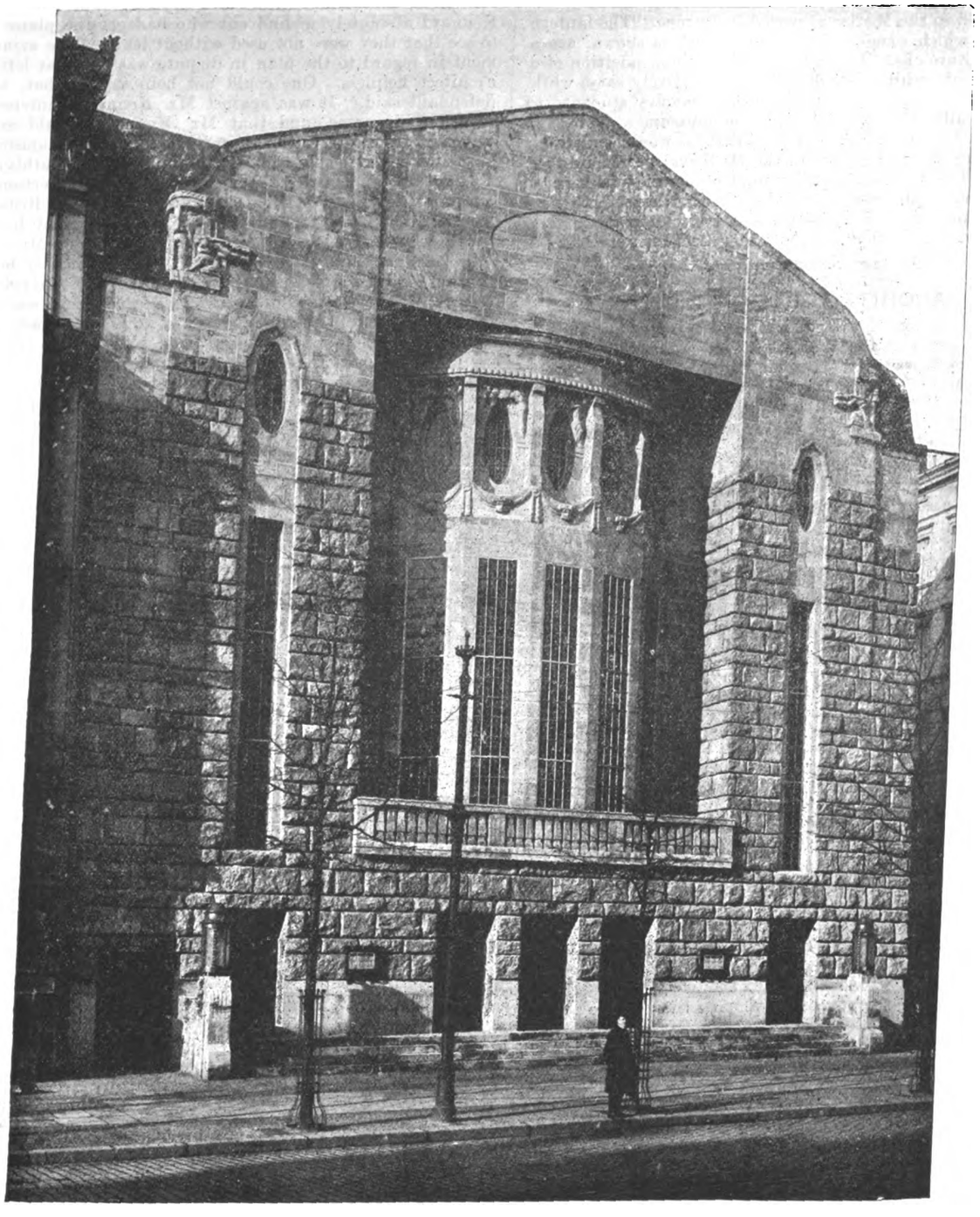
THE HEBBEL THEATRE, BERLIN.

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MEDIÆVAL ARCHITECTURE.

MR. BANISTER FLETCHER, F.R.I.B.A., gave on Monday last the first of a course of twenty-four university extension lectures on "Mediæval Architecture" at the Victoria and Albert Museum, South Kensington, S.W.

He dealt, firstly, with the nature of the lectures to be given under the auspices of the University of London during the coming session, and explained that he would deal with the study of architectural history on broad lines from a popular point of view, and trace its evolution in the different countries of Europe. He referred to architecture as a visible exponent of civilisation uniting and embracing the other arts, and pointed out that all modern design was founded upon old art, although altered in order to conform to existing conditions. Architecture being the basis of all design, a knowledge of it was necessary to designers and art students, and was also of use to a much larger class which practically included the whole community. The author and novelist required a knowledge of the subject for the setting up of a historical novel, because a mere story about people without any reference to the buildings they inhabited was uninteresting and insipid. The journalist and the photographer also could not take an intelligent interest in their work without a knowledge of it. The connoisseur should also be interested, for the fascination of collecting was much increased by a knowledge of the dates and character of successive periods of architecture. The teaching profession now realise that to make history interesting the student should be taught not only what men did but what they made, not only that they fought battles, but what sort of buildings they lived in and the churches they erected for the worship of God.



THE HEBBEL THEATRE, BERLIN.—VIEW OF MAIN FRONT.

The lecturer also dealt with the general student, pointing out the necessity of a knowledge of architectural history in order to appreciate travelling, which had been rendered so easy in these days, for to travel without a knowledge of architecture is like having a book in front of one without the ability to read it. An improvement in English architecture would undoubtedly be brought about by the study of the most beautiful examples of past styles.

Mediæval architecture was a continuous evolution from the early round arched or Romanesque period to the pointed arch or Gothic period, and was not the result of efforts

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reflecting the tastes and ideas of individual architects, but was the result of forces and tendencies underlying the whole life of mediæval times.

Mr. Fletcher referred to the prominence of the clergy, the monastic communities, the secular canons and friars and military orders, and the extraordinary power and influence of the Papacy, the Crusades and the influence of dogma on church planning, the condition of the people, the wild state of the country, with few roads, and the necessity of pack-horses for carrying building materials, the feudal system, the growth of the towns and the trade guilds of London. Views were then shown connecting Mediæval architecture with the styles of the past, also of the various types of buildings erected in the Mediæval period in Europe. The lantern slides, of which some twelve hundred will be shown, are a special feature of the lectures, rendering the acquisition of a knowledge of architectural history comparatively easy, while the Visiting Class after each lecture enables students to systematically study the objects in the museum.

In conclusion, the lecturer said that he would endeavour to introduce the atmosphere of the Mediæval period into the lectures so as to form a background of association between history and architecture, and hoped that henceforth they would appreciate old buildings and be able to study their life history and understand how they had been erected.

ARCHITECT'S COPYRIGHT.

THE conclusion of a legal action of interest to architects took place at the Watford County Court on Monday. The plaintiff was Mr. Harold Kennard, an architect, of 2 Verulam Buildings, Gray's Inn, W.C., and he sued the defendant, Mr. James Rodwell, a builder, of Watford, for payment for the use of his plans, a house having been built from them at Bushey, Herts.

Mr. Costello, barrister, appeared for the plaintiff; and the defendant was represented by Mr. C. E. Dyer, barrister.

This case was commenced at the May sitting of the Court, and adjourned for the production of material evidence.

At the first hearing the plaintiff said that he made a speciality of domestic architecture. In 1908 defendant called at his office with reference to a house he was erecting at Bushey. Defendant noticed some plans for a house, and said that he would like a copy as he would be likely to find a customer. He allowed defendant to have a copy of the plans. Subsequently he saw a house at Bushey which had been erected from his plans with one exception. He made out an account for 24*l.*, which he considered a fair charge for the use of the plans. The house at Bushey could not have been built without reference to his plans.

Cross-examined, he did not suggest to Mr. Rodwell that he should have plans to submit to building owners.

Mr. E. T. Gilder, an architect, of Watford, stated that the plan was handed to him by Mr. E. H. Cuthbertson, of Bushey, with instructions to proceed with the necessary drawings for the builder to work upon.

The case was then adjourned for the attendance of Mr. E. H. Cuthbertson.

At the hearing on Monday it was stated that Mr. Cuthbertson was in America, and the case was proceeded with.

Defendant gave evidence to the effect that plaintiff lent him plans for the purpose of placing them before prospective clients. He showed the plans to Mr. Cuthbertson, but nothing came of it. He did not mention the plaintiff's name to Mr. Cuthbertson with reference to the plans.

His Honour, in summing up, said he had come to the conclusion that the plaintiff was entitled to claim his verdict. It seemed to him one of those cases where one must look at the surrounding circumstances and look at the nature of the transaction between the parties. The plaintiff had a property which to him was valuable. He had the design for a house. The value of that design was largely in proportion to its originality. It might not be of much importance to him whether it was seen by a large number of persons or not if it was a design of artistic character and possessing artistic merit. He had to ask himself, How was it likely that an architect would deal with that plan when it came to the matter of allowing it to pass out of his hands? Here the defendant came, and it was important to notice this, that there was a special agreement between him and plaintiff. The defendant relied himself upon a special arrangement, different entirely from the arrangement that the plaintiff relied upon. The arrangement that the defendant relied upon was this, that this was an arrangement for the mutual benefit of the architect and the builder. The arrangement was perfectly legitimate and not at all uncommon, that the builder should do his best to introduce the plans of the architect to persons who were likely to build, and in that way the architect would secure the use of his plans. If the building owner looked at them the builder would get the building contract, and each would get a benefit from the transaction. In regard to shops that defendant built at Chalk Hill, and a house for Miss Griffen, from plaintiff's plans, the defendant's position in regard to the plaintiff was this—he took care to provide that he paid plaintiff directly for the use of his plans. There was this arrangement in these cases, not that Mr. Rodwell should get possession of the plans and show them to everybody and leave Mr. Kennard absolutely to find out who had got the plans and to see that they were not used without leave. The arrangement in regard to the plan in dispute was one that left the architect helpless. One could not help saying that, when defendant said "It was against Mr. Kennard's interest to mention his name, and that Mr .Kennard should expect payment from Mr. Cuthbertson." Under the circumstances it would be extremely difficult to apply to Mr. Cuthbertson to pay Mr. Kennard for plans which Mr. Cuthbertson did not know Mr. Kennard had any interest in. Mr. Rodwell's action was probably an error of judgment, and he still remained silent when he got the plans back from Mr. Cuthbertson's architect slightly altered. In this matter he left plaintiff absolutely in the dark. The house erected presented all the features of plaintiff's plan, and he was asked to say that there was an expressed or implied contract on the part of defendant to pay for these plans. The fact that defendant meant to help plaintiff by introducing his plans to prospective clients would not prevent defendant from using the plans. Mr. Cuthbertson did adopt this plan, and chose another architect. Mr. Rodwell placed the plans before Mr. Cuthbertson as desirable plans, and permitted them to remain in his custody. He concurred with the evidence of the plaintiff in the case that there was an expressed contract on the part of Mr. Rodwell to pay for the plans. His Honour then gave judgment for the plaintiff.

ILLUSTRATIONS.

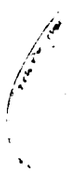
GRAND TRUNK RAILWAY OF CANADA, COCKSPUR STREET, S.W.

ON May 14, 1909, we published an exterior view of the new building erected as offices of the Grand Trunk Railway of Canada from the designs of Sir Aston Webb, C.B., R.A., with a description thereof. We now have the pleasure of illustrating the interior of the board-room and general office of the company, with a detail of the beautiful frieze in the latter painted by Mr. Frank Brangwyn, A.R.A.

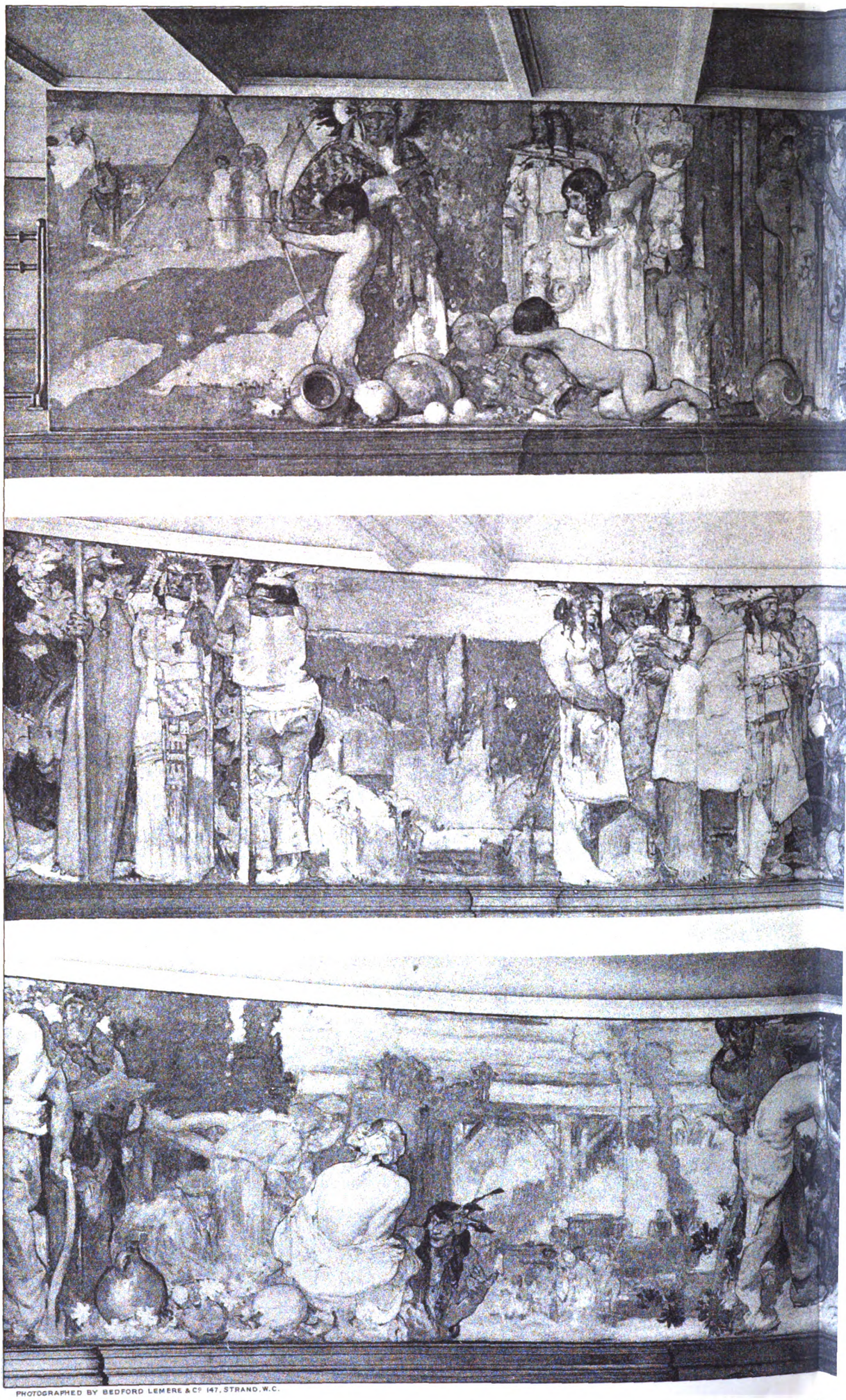
HOUSE AT HENLEY-IN-ARDEN, WARWICKSHIRE.

THE house itself is built of ordinary local bricks, cement roughcast, the chimneys, garden walls, and stable-yard walls of thin red bricks from Titford Brick Co., Blackheath, Staffordshire. The roofs are covered with Kentmere slates in graduating courses by Messrs. A. W. Allard & Co. The garden paths and terraces are paved with York stone paving from Hawes, Yorkshire. The hall, passages, kitchen, and offices are paved with Martin Van Straaten's unglazed black tiles. All the joinery is in Austrian oak, the windows being in Ancaster stone with iron casements by Messrs. Weldon & Co., of Croydon. There are no wood linings or architraves to the windows, the sills being finished with Martin Van Straaten's green glazed Dutch tiles. The skirting is also formed of the same coloured tiles as the window sills, and is set flush with the plaster, the plaster being adamant plaster in one coat, finished with wood float without any fine finishing material, and twice distempered white, the idea being to have no places for dust and nothing to paint, and so reducing the upkeep to its smallest dimensions. The architect was Mr. C. F. A. Voysey. The lavatory fittings, valve closets, and bath are by Messrs. Pontifex & Sons, of Shoe Lane, E.C. The gutters and down pipes are in oak. The bells, with musical voices, are rung by means of wires and cranks. All metal fittings, locks, keys, knobs, hat and coat hooks, &c., are by Mr. W. B. Reynolds, of 7B Old Town, Clapham, S.W. All stable fittings are by the Carron Co., of Upper Thames Street, E.C. The general contractors are Messrs. J. Jarvis & Sons, of 255 Hackney Road, N.E

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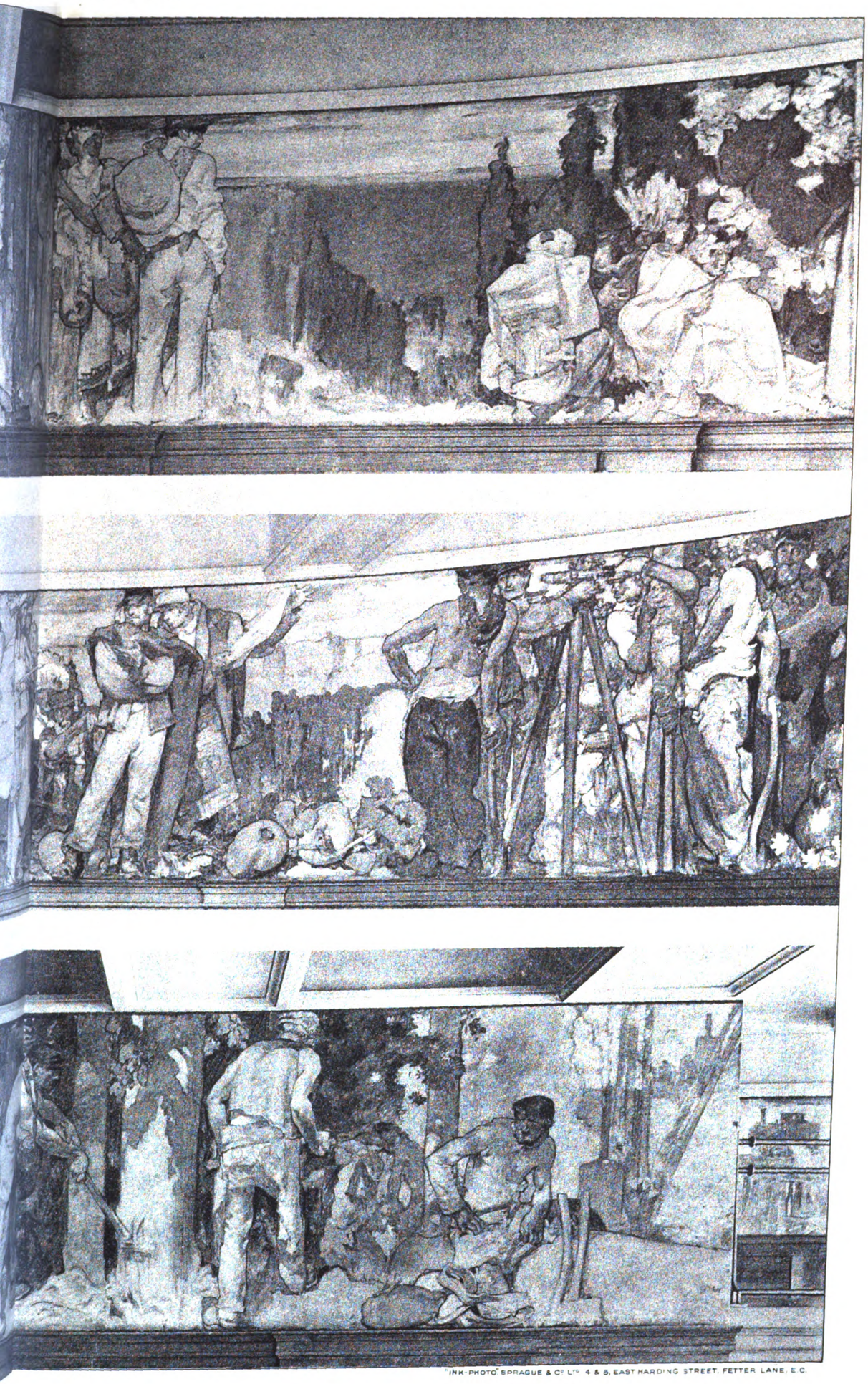
PHOTOGRAPHED BY BEDFORD LEMERE & Co 147, STRAND, W.C.

GRAND TRUNK RAILWAY OF CANADA, COCKSPUR STRE

SIR ASTON WEBB, C.B.,

Mr. FRANK BRANGWYN,

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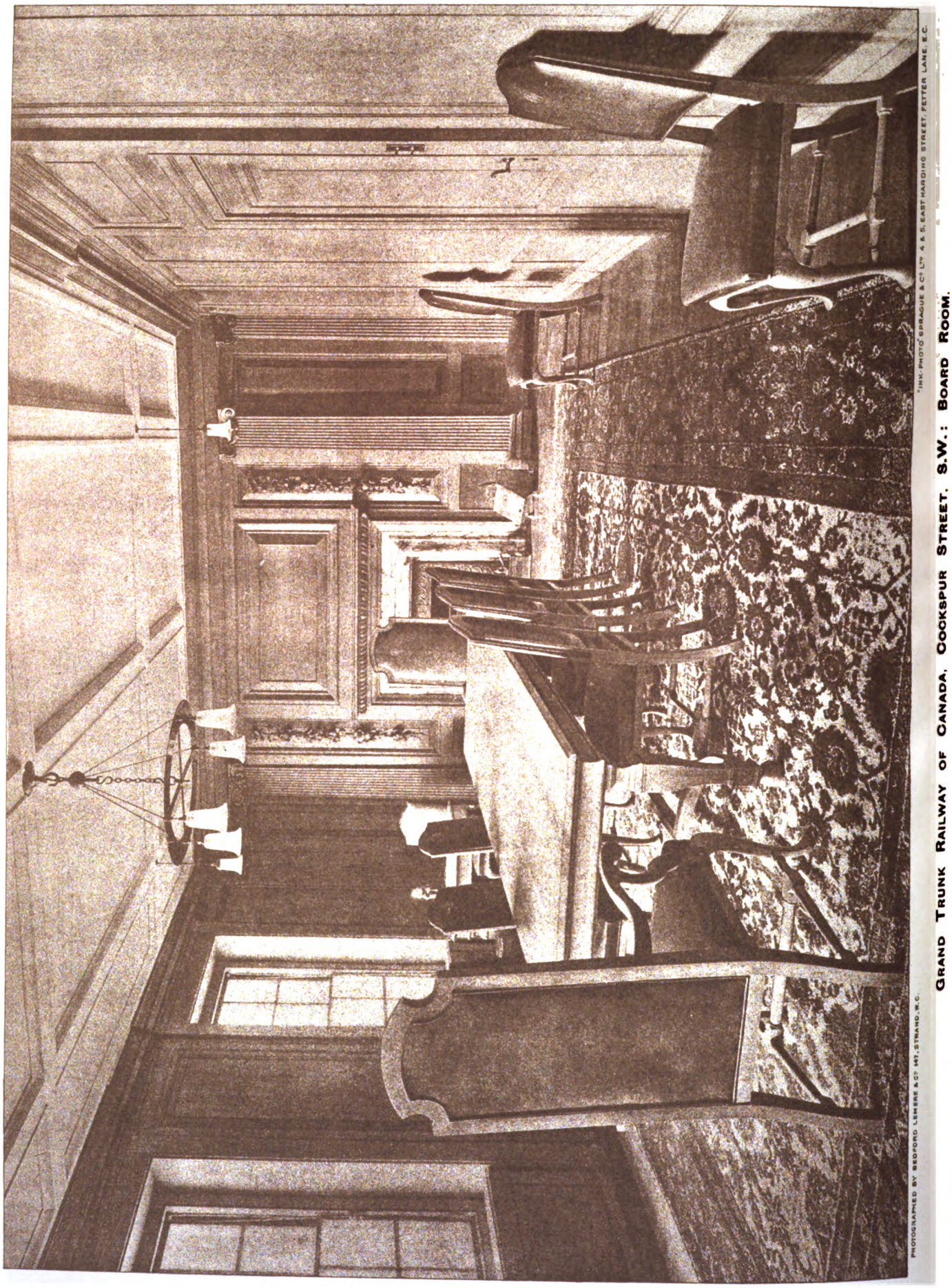
C.B., R.A., Architect

YN, A.R.A., Painter.

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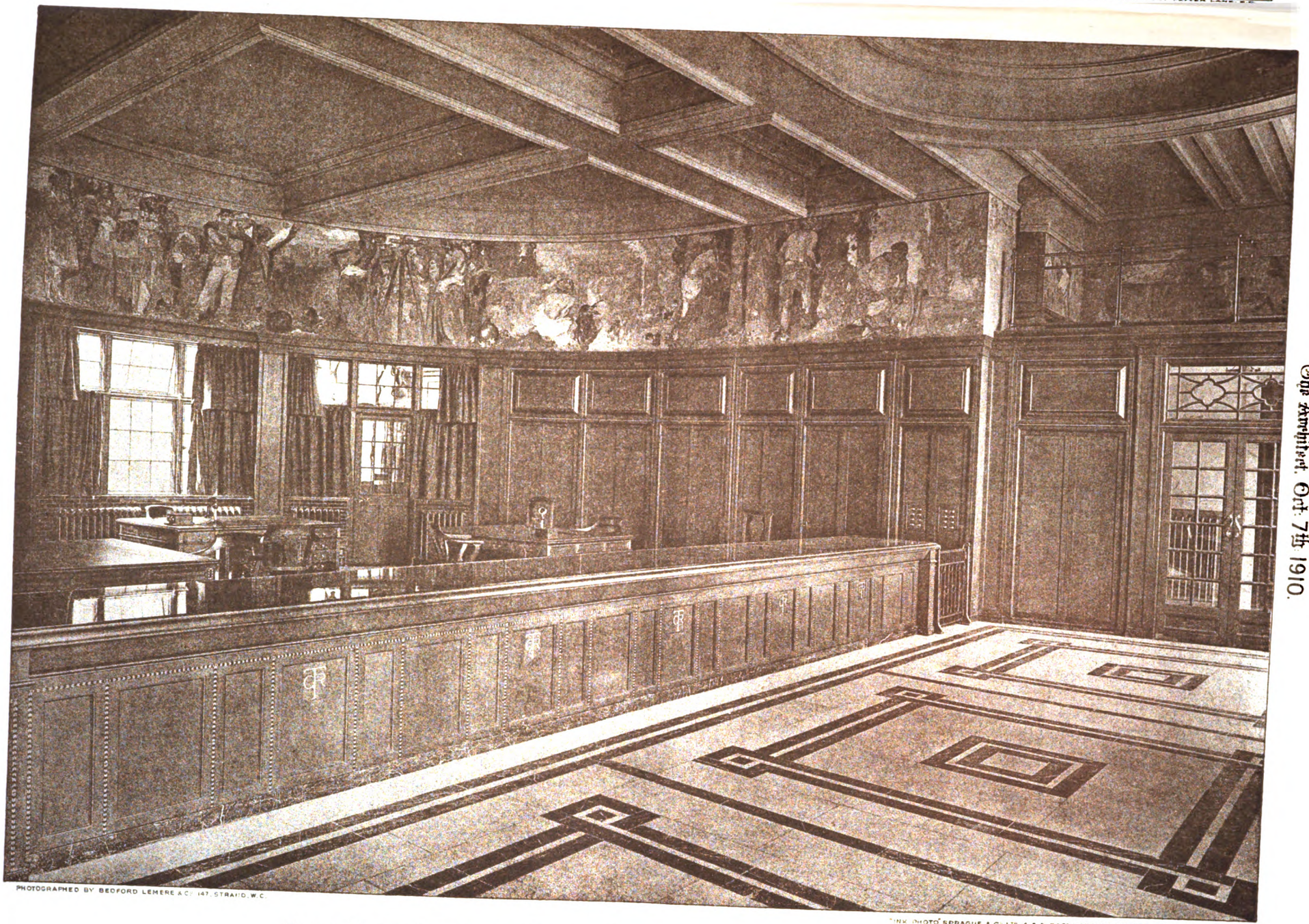
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GRAND TRUNK RAILWAY OF CANADA, COOKSPUR STREET, S.W.: BOARD ROOM.
SIR ASTON WEBB, C.B., R.A., Architect.

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GRAND TRUNK RAILWAY OF CANADA, COCKSPUR STREET, S.W.: GENERAL OFFICE

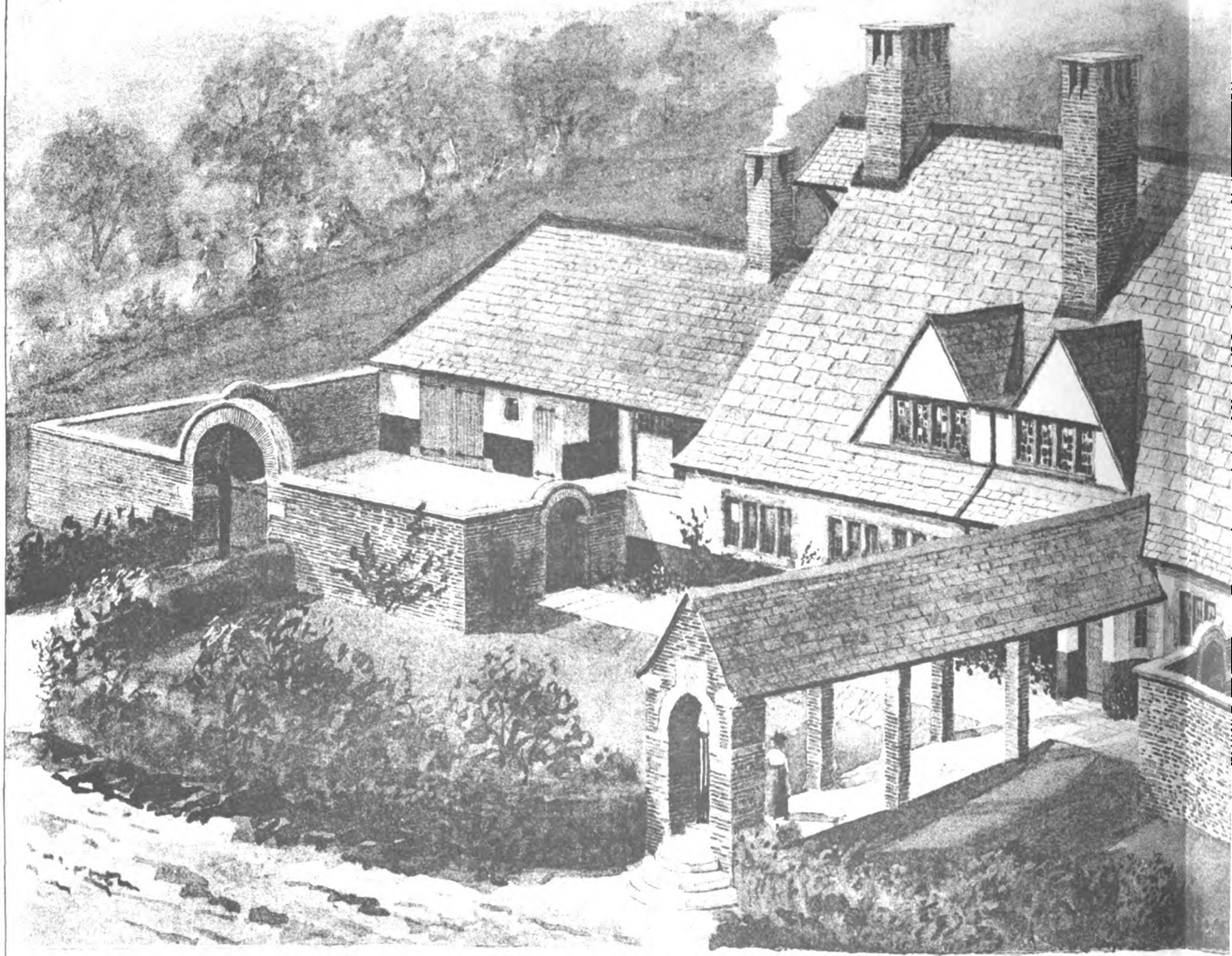
SIR ASTON WEBB, C.B., R.A., Architect

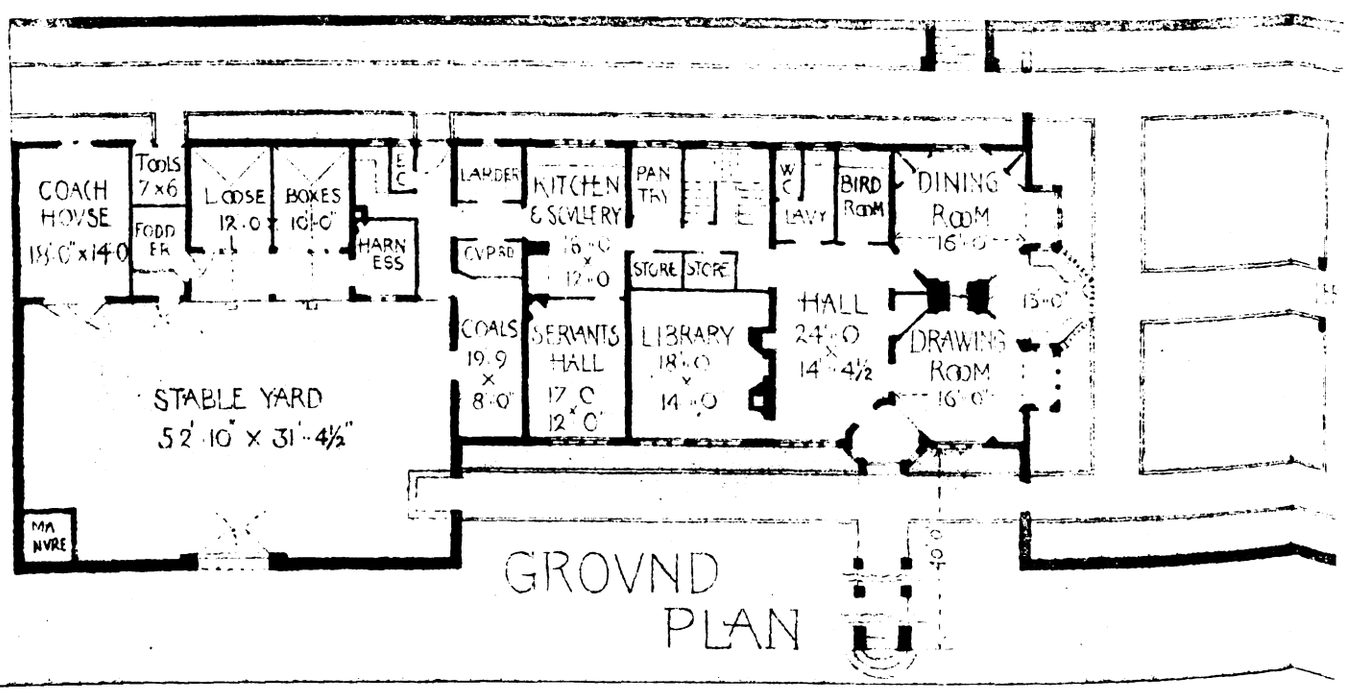
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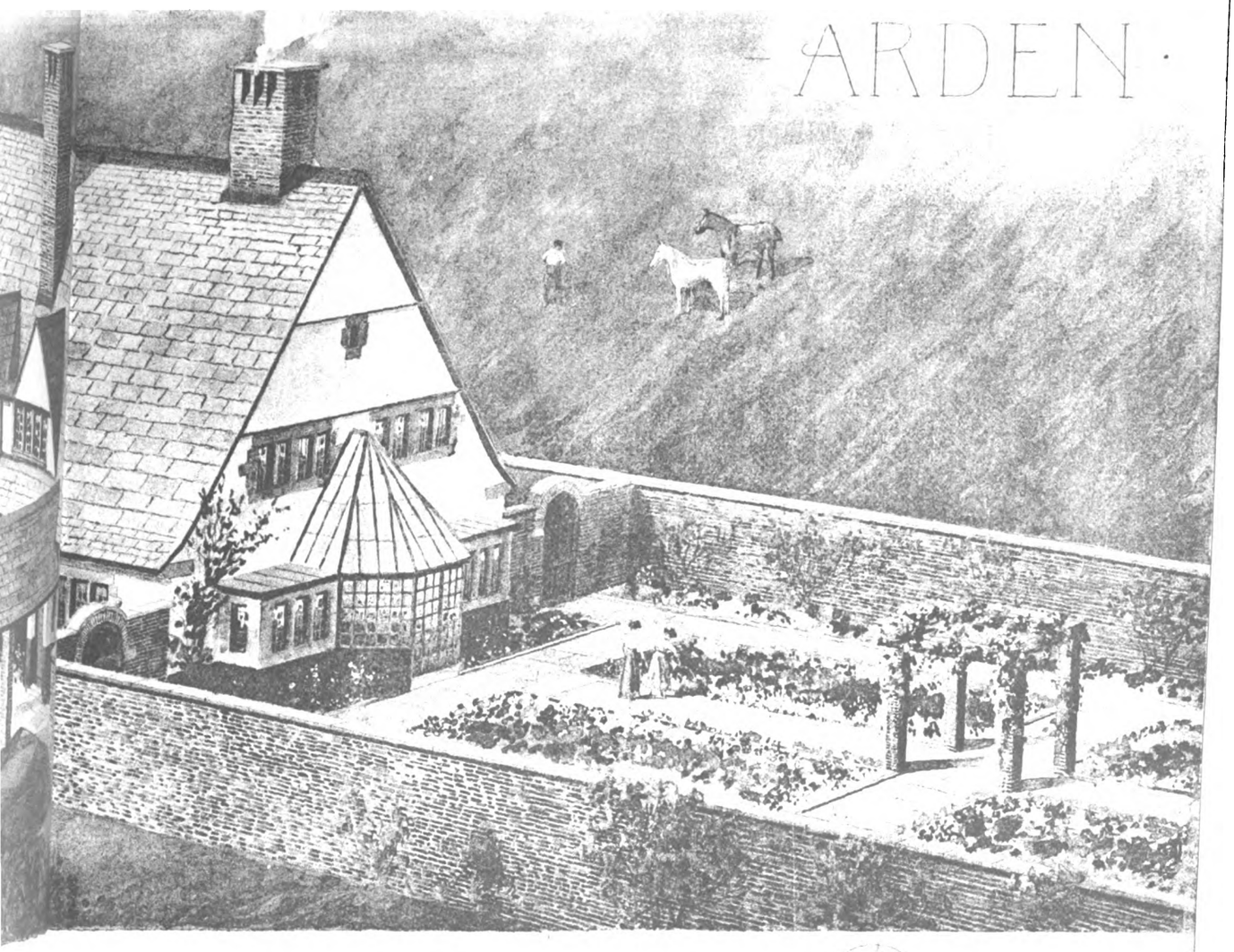


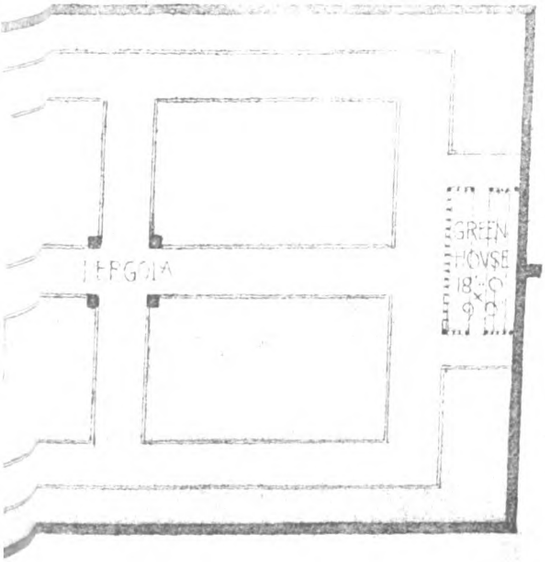
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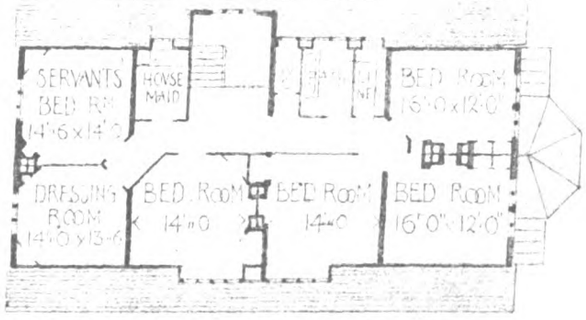
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The Architect: 7th: 1910.

NIGHT AT HENLEY IN-ARDEN







FIRST FLOOR PLAN.

C·F·A VOYSEY ARCHT.
23·YORK PLACE·BAKER·ST·W

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PETROL AIR-GAS.

THEORY AND PRACTICE OF THE NEW ILLUMINANT.

ILLUMINATION OF INTERIORS.—PART I.

By Professor C. A. M. Smith, M.Sc.

AIR-GAS is the name given in general to a mixture of air and the vapour of some inflammable spirit, such as petrol.

Although in recent years a number of firms have been started for the purpose of placing on the market apparatus designed for the generation and distribution of such gas for illuminating and heating purposes, there is practically no literature on the subject, at any rate in the English language.

By "literature" we mean scientific writings from an unbiassed and disinterested point of view. Of course the various firms interested in the manufacture of the apparatus concerned generally publish pamphlets in which they "prove" that air-gas can be made for about half the price of any other illuminant, taking the cost at so much per candle-power per hour; and, further, that the gas made by *their* apparatus has overwhelming advantages over that made by rival systems.

How keen is the feeling existing about the matter has been well demonstrated by articles which have recently appeared in the engineering columns of the *Daily Telegraph* and *Times*. In both papers the correspondent has received letters flatly contradicting each other. Representatives of air-gas firms declare that the cost stated by the writer was 100 per cent. too high; the gas engineers declare that the cost should have been made 100 per cent. higher.* It is hoped that this impartial investigation and discussion will assist persons not financially interested in any particular system to obtain a clear conception of the subject. The writer would ask interested parties that they should believe that the matter has been approached with an open mind, and that any results obtained are based on indisputable scientific facts or on personal examination and tests made with such accuracy as was possible. As far as possible "odious comparisons" between the merits of different makers' apparatus have been avoided.

Liquids Generally Employed.

(*a*) The liquid principally used at the present time is a mixture of the light paraffins generally known as "petrol." Strictly speaking, the term petrol should be confined to one particular brand, but it is now commonly used to describe all the petroleum spirits used for motor vehicles. Petrol consists of a mixture of liquids known to chemists as the paraffin group, the particular paraffins in ordinary petrol ranging from pentane (C_5H_{12}) (approx. density 0.600) up to octane (C_8H_{18}) (approx. density 0.710).

(*b*) *Benzol.*—This was originally a chemical synonym for benzene, but its growing importance during recent years has caused the name to be applied to the commercial product from gasworks. This benzol consists of a mixture of benzene, toluene, and a small percentage of other hydrocarbons. The usual method of describing a commercial variety is by some such term as "90 per cent. benzol," which denotes a mixture 90 per cent. of which boils below 100° C. An analysis of a particular sample, which may be taken as characteristic, gave a composition of 85 per cent. benzene, 14 per cent. toluene, and 1 per cent. of other hydrocarbons. Benzene has the natural formula C_6H_6; toluene, C_7H_8.

At the present time benzol is very little used either for explosion motors or for making air-gas, but there is possibly a future for it in both directions.

Seeing that it is a home product its use should certainly be encouraged.

The Principles of Air-gas.

The principle underlying all air-gas apparatus is simply to carburette air by contact with volatile inflammable liquids, such as benzol, petrol, &c. Scientific data concerning these liquids are given below, but it may here be stated that they all have vapour pressures sufficiently high to allow of air absorbing a considerable quantity even at low temperatures. This principle, though simple, is difficult to apply for the following reasons:—

(1) Carburation must be constant.

(2) Apparatus must be self-regulating—*i.e.* mixture must be constant for any load.

(3) The mixture must be intimate.

Calculations will show that air is capable, at normal temperatures, of absorbing considerably more vapour of the liquids employed than it is able completely to burn. For this reason air-gas systems divide themselves into three kinds:—

(1) The liquid is vaporised in the burner.

(2) The mixture is saturated or nearly saturated.

(3) A very dilute mixture of air and vapour is employed.

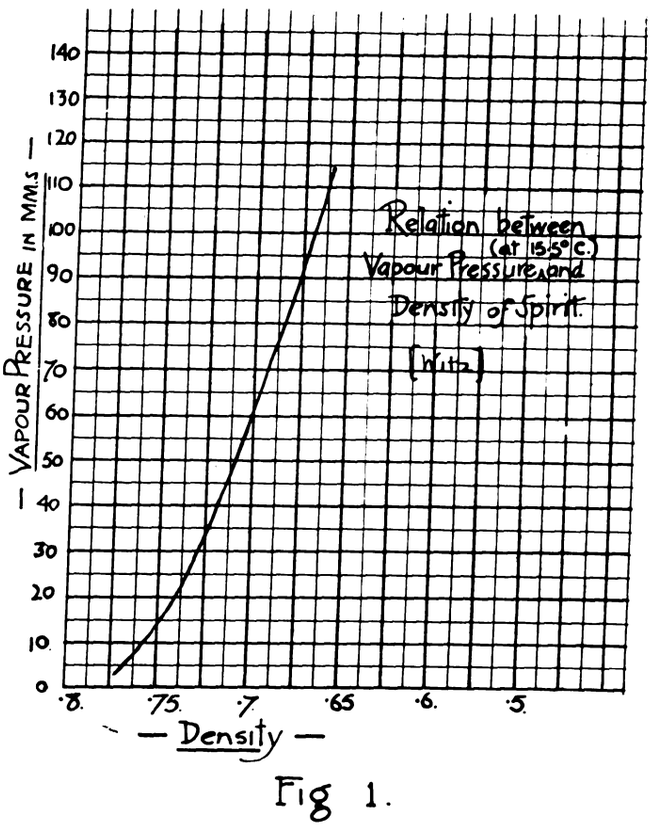


Fig 1.

Systems employing the third generally have slightly more air than is sufficient for complete combustion, and consequently the resulting flame is non-luminous.

Recent research by Professor W. A. Bone has shown that combustion is by no means the simple direct combination such as might be expressed in the case of hexane—

$$C_6H_{12} + SO_2 = 5CO_2 + 6H_2O.$$

This reaction is nearly correct, however, when the proportions of air and vapour are correct for complete combustion, and since no free carbon is formed there is nothing to cause luminosity. Before the introduction of the incandescent mantle such a flame would have been useless for illumination purposes.

On the other hand, when the mixture is not thus correctly proportioned, free carbon is deposited during burning, and the heat of combustion causes the minute

* The following are examples of the rash statements made by some firms: "The volume of gas produced from a gallon of petrol is 1,385 cubic feet. The result of a number of experiments places the temperature of the flame at 2,900° Fahr., with a calorific value of 180 British thermal units per cubic foot of gas." It is a direct deduction from the above that 1 gallon of petrol gives 180 ×1,385 B.T.U.'s=249,500 B.T.U.'s. Assuming the density of spirit at .700 this is equivalent to 35,600 B.T.U.'s per pound, a statement which every engineer would see to be absurd. Another gentleman points out the impossibility of committing suicide by means of air-gas, and blandly states that "for this reason alone it well merits the name of safety gas!"

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particles of carbon to glow with a white heat—in other words, the flame is luminous.

Down to a certain point the flame is more luminous the more saturated the mixture. Hence with the original system of burning in an ordinary batswing or argand burner it was desirable to employ a gas containing as much vapour per cubic foot as the air would hold at the particular temperature and pressure. This necessitated several conditions which are not so important in modern systems.

Fig. 1 shows a curve relating the vapour pressure at 15.5° C. (normal room temperature equivalent to 60° F.) of various "petrols" to their density. It will be seen that there is an enormous difference between the vapour pressure of, say, .760 spirit and .660 spirit. Now, as will be shown later, the amount of vapour which can be absorbed by air depends directly on the vapour pressure. Hence to obtain a rich mixture it was necessary to employ a low density spirit, say from .650 to .680. Further, trouble was always arising owing to condensation in the pipes.

From fig. 2 it will be seen that the vapour pressure, and, consequently, the quantity of vapour necessary for

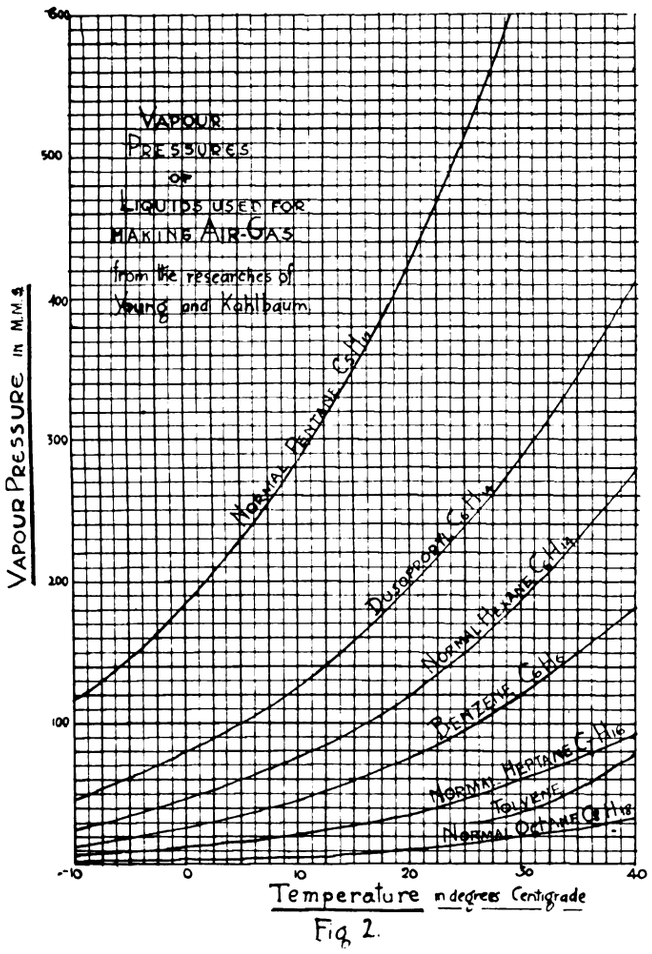


Fig. 2.

saturation, falls with the temperature whichever liquid is used. Consequently it was necessary to provide receptacles into which the condensed liquid could run, and means by which it could be removed.

Danger Attendant on Certain Mixtures.

The real disadvantage of these highly saturated vapours was, however, their danger. Air absolutely saturated with petrol vapour is not very explosive, though it may be made so by compression. Similarly, air containing just sufficient vapour to allow of combustion, which point practically coincides with that necessary for complete combustion without added air, is also non-explosive. But at some intermediate points a highly explosive mixture is formed. It is clear that should the highly saturated gas leak into the air the explosive point may easily be reached and a disastrous explosion may result. On the other hand, leakage of weak gas into a room would make a mixture so weak as not only to render it non-explosive but almost incombustible. It should, however, be pointed out that even saturated gas is no more explosive than is coal-gas, though they both become explosive under like conditions. The only point where the danger of air-gas exceeds that of coal-gas is that some disarrangement of the generating apparatus could easily lower the mixture to the explosive point, although such a disarrangement is not likely in the case of a well-designed apparatus.

There is a danger common to all air-gas systems employing low-flash spirits—that arising from the storage of these inflammable liquids or from charging the generating plant. This danger should, however, be reducible to a minimum by taking reasonable precautions.

(*To be continued in our issue of October* 21.)

ROYAL ARCHÆOLOGICAL INSTITUTE.

EXACTLY fifty years ago the London and Middlesex Archæological Society paid a visit to Westminster Abbey. As a result of it there was produced an important work entitled "Gleanings from Westminster Abbey," by Mr. G. Gilbert Scott, R.A., with appendices by several authorities. When the Dean of Westminster welcomed the Royal Archæological Institute in the Jerusalem Chamber on Tuesday last, he expressed a hope that their visit might be equally fruitful. The Archæological Institute have for a great many years past felt that it would be a great advantage if they could make a thorough survey of the monuments of London, and do it in a way which was impossible for a casual society to accomplish in a half day or whole day visit. After mature consideration it was decided to try the experiment, and to make a start with the incomparable Westminster Abbey. It is proposed to hold such meetings two or three times a year, preferably in spring and autumn, and to visit buildings like the Tower of London, the Charterhouse, the City churches and halls, Southwark Cathedral, and perhaps Hampton Court, St. Albans, Waltham Abbey, and Windsor Castle.

Though two whole days, from ten o'clock in the morning till about five o'clock in the evening, were given up to Westminster Abbey, it was found necessary to leave parts of the abbey church, all the monuments and furniture, together with some of the monastic buildings, to a future visit. The party assembled, as already mentioned, in the Jerusalem Chamber, where the Very Rev. the Dean gave a short account of Edward the Confessor's church, illustrated by plans. The Dean takes a very active and practical interest in the Abbey, and to him may be credited, directly or indirectly, a very great share in the many new and important discoveries made by recent investigation. Attached to the programme issued in connection with the visit was a large and excellent plan, prepared by Mr. Arthur G. Wallace, architect, who has for a long time been connected intimately with the fabric. The plan was in illustration of the Dean's paper, for it showed the relative positions of the church of the Confessor and the existing one. This is of necessity conjectural to a considerable extent. Parts of the eastern portion of the Norman church have been unearthed. When Henry III. rebuilt the Confessor's church in the thirteenth century, the level of the presbytery was raised 5 feet. Accordingly the Norman piers were not entirely pulled down, fragments of their lower portions being utilised as a foundation for Abbot Ware's pavement. Three of these were discovered by Gilbert Scott when the present altar was being erected, and recent research has revealed a portion of the apse.

When Edward the Confessor was crowned in 1043, after thirty years' exile in Normandy, he remembered the many kindnesses received from Robert, Abbot of Jumièges. He accordingly brought him to England. Robert had begun three years before to build his own abbey church of St. Mary. In 1044 he was created Bishop of London, and in 1051 Archbishop of Canterbury. But his Normandising ways rendered him so unpopular that in the following year he had to flee the country. What was more likely, the Dean asked, than that the new Westminster Abbey should follow the design of the church in course of erection at Jumièges, or even that it was designed by Robert himself? Mr. W. R. Lethaby having suggested that they must look to Jumièges for the prototype of the Confessor's abbey, the Dean went over to Normandy to study the former building. He was struck by many close resemblances both in plan and structural details. These he described with the aid of diagrams. The plan

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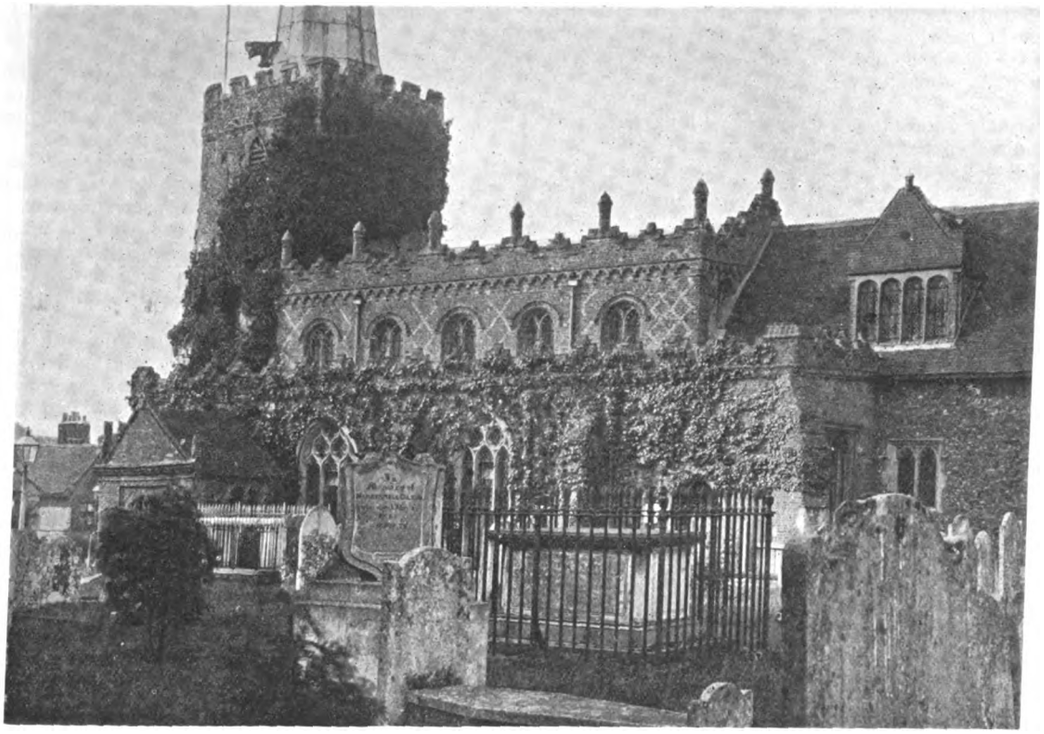
prepared by Mr. Wallace shows the outline of the Confessor's church as corresponding in width to the present structure, while it stopped short in a porch three bays from the present west end. There were apses to the nave and aisles, and also the east wall of the two transepts was rounded. The Norman cloister is represented as of the same area, though diverging a few feet from the existing one. The eight bays from the west end to the central tower give the same number and the same length as at Jumièges, though the building would be somewhat wider. The Dean expressed his belief that the nave piers are not now in precisely the same position as in the Confessor's building. At Jumièges no two successive piers are spaced at the same distance apart.

The later history of the building was explained by Mr. W. H. St. John Hope, who commenced by paying a tribute to the interest taken in his church by the Dean. The first addition to the Confessor's building was, he said, a Lady chapel erected by Henry III. in 1220. It is impossible to give its precise position. When that monarch embarked on the reconstruction of the abbey in 1234 he adopted a spacious plan. Henry III.'s work began at the extreme east end, and stopped short in 1250 after the first bay of the Norman nave was rebuilt. There was no need to go further, as the only people with rights in the preceding church were accommodated specially in the adjacent St. Margaret's. After transepts were added, however, the choir was carried a considerable distance westwards. Under Henry V. the work of rebuilding the Norman nave went on at a very rapid rate on the west side of the solid screen which closed in the part completed in the reign of Henry III. The design was minutely copied from the thirteenth century work. Mr. Hope also dealt with the position and use of the monastic buildings.

The party next ascended to the south triforium, and so round the building, under the guidance of Mr. Hope. In addition to observing the splendid views obtainable at various points, attention was drawn to the springing of the flying buttresses which appears against the outer walls, as also to the several remarkably-carved corbels round the eastern end carrying the aisle roof. The party then descended to the ground level, and followed Mr. Hope's earnest advice to ignore the fascination usually exercised by the memorial inscriptions so as to have an eye for the manifold architectural beauties.

In the afternoon a considerable time was spent in the Undercroft, south of the chapel of the Pyx, which has been swept and garnished as a memorial to the late Mr. Micklethwaite, and used to display various remains discovered from time to time. Here the Rev. R. B. Rackham gave extracts from the architectural history of the nave from 1298 to 1375. Mr. P. M. Johnston showed lantern views illustrative of the architectural carvings in the abbey. He has every reason for saying that these are worthy of being reproduced in a monumental work. An account of the tiled floor of the chapter house (described by Scott as probably the most perfect and one of the finest encaustic tile pavings remaining) was given by Mr. P. B. Clayton. Finally, Mr. W. R. Lethaby made comments on the paintings of the Abbey with special relation to some drawings by Mr. E. W. Tristram. The concluding visit of the afternoon was to Henry VII.'s Chapel, which was described by Mr. Hope.

Wednesday was given up to the monastic buildings, including the Dean's House, the Abbot's Hall, the Cloister, the Chapel of St. Faith, the Chapter House crypt, the Chapel of the Pyx, the Undercroft, the Frater hatch, the Infirmary cloister, chapel, and hall, and the Chapel of St. Catherine.



GREAT BADDOW CHURCH, ESSEX, FROM SOUTH-EAST.

CHELMSFORD, GREAT BADDOW AND DANBURY.*

TO many of us, perhaps, Chelmsford has been nothing more than the name of the first important stop out of London on the Great Eastern Railway. We may have noticed from the line the curious looking spire of its church, but our interest and knowledge of the district has stopped at this point. Chelmsford is in no sense a final town, a world's end with nothing of remark beyond, as for example is Norwich, but it is the first link in the chain of important East Anglian towns—Chelmsford, Colchester, Ipswich, Norwich—spaced at regular intervals, as if for convenient stopping places on an up-to-date railway.

This posting-house position is nothing new for the town: its numerous and ancient inns are reminiscent of the jolly days of the stage-coach. It even requires no great effort of the imagination to picture Mr. Pickwick tucked up in the Norwich coach, pulling up, shall we say at the Saracen's Head, on his way to the Eatanswill election. Indeed, the accounts of electioneering times which remain have just the atmosphere of Dickens' Eatanswill scenes.

On a little island in the Chelmer, called Mesopotamia, mock elections were held in travesty of the parliamentary event. Hustings were erected outside the Duke's Head, and

* Read at a meeting of the Upper Norwood Athenæum by Mr. Harold F. Murrell, A.R.I.B.A.

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two local candidates elected. Thus Sir John Carrots paraded the streets delivering comic election addresses, very much as friend Hunnable recently. A charge of one penny was made per vote, the successful candidate after chairing round the town being ducked in the river to cool a possibly swelled head.

Chelmsford is supposed to be identical with the Roman station of Cæsaromagus, and its position on the direct road from London to Colchester makes it most probable that it was in Roman occupation, a view supported by the discovery of a large Roman villa here in 1847.

Situated at the junction of the Chelmer and the Cam, it soon attained prominence, and is mentioned in Domesday as Celmeresford, Celmeresforda, and Celmeresfort. From the time of Edward the Confessor till 1545 the town was the property of the See of London; in that year it was conveyed by Bishop Bonner to Thomas Mildmay, whose descendant, Sir John Mildmay, is still lord of the manor. The following is from a survey of the parish in 1591 taken for the Mildmays, then lords of the manor:—

"Chelmersford is one ancient goodly manor situate in the heart of the county in good and wholesome air, conveniently and well housed and well built for timber and tile. The chief manor house was, in the time of Edwarde the Thirde, brent and wasted with fire, and before that it seemed to have been some ancient barony. Within this manor is situate the town Chelmeresford, sometimes written the Burrowe of Chelmerford, well situated, with more than 300 habitations, divers of them seemly for gentlemen, many fair inns, and the residue of the same habitations for victuallers and artificers of city-like buildings."

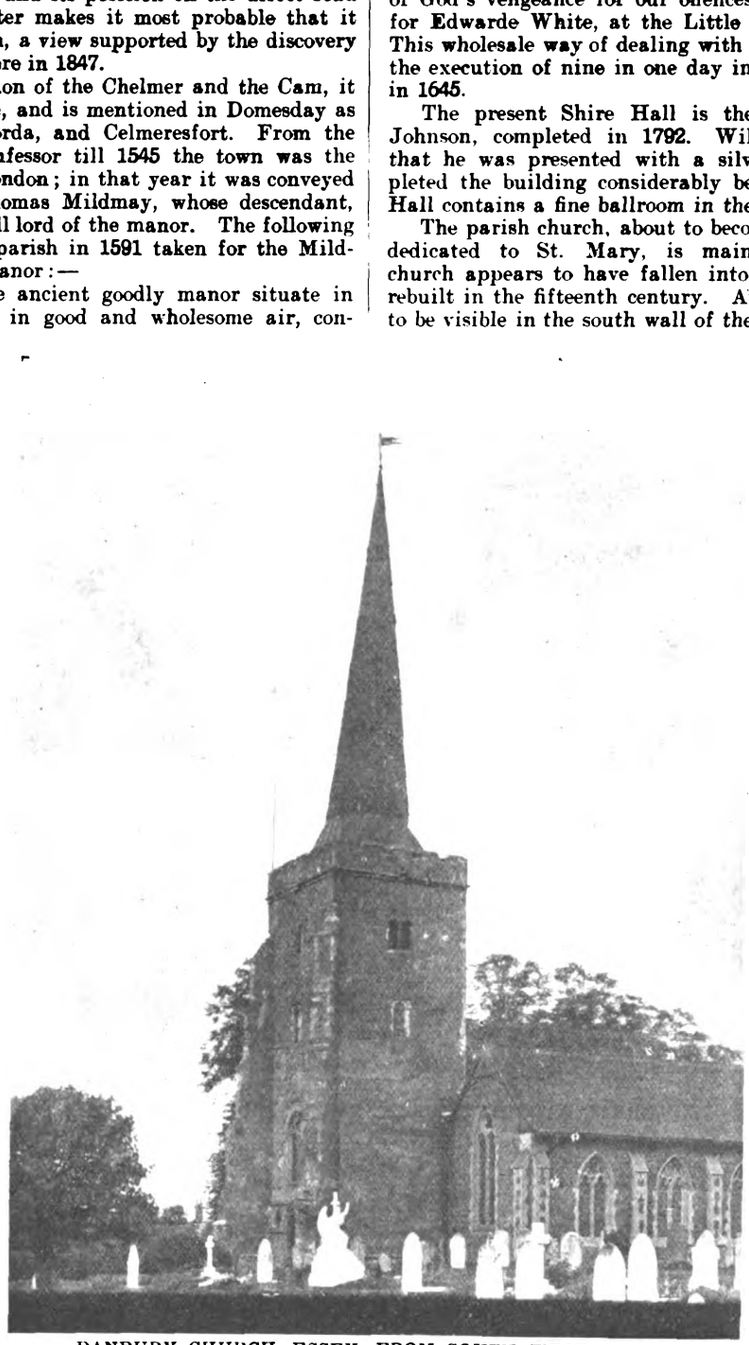
Chelmsford has been the shire town of Essex since the time of Henry VI.; the Shire Hall is one of its important buildings. In 1489 the gentlemen of Essex were summoned to Chelmsford to welcome Henry VII., and incidentally that the Lancashire men might see "that there were gentlemen of so great substance in Essex that they could buy all Lancashire"—a demonstration that unfortunately did not come off.

Essex seems to have been a great place for witchcraft. The following is from the title-page of a book published in 1579:—

"A detection of Damnable Driftes practised by three Witches arraigned at Chelmsford in Essex at the last assize there holden, whiche were executed in Aprill 1579. Set forthe to discover the Ambushement of Sathan, whereby he would surprise us lulled in securitie and hardened with contempte of God's vengeance for our offences. Imprinted at London for Edwarde White, at the Little North-doore of Paules." This wholesale way of dealing with witches was evidenced by the execution of nine in one day in front of the Shire Hall in 1645.

The present Shire Hall is the work of the architect Johnson, completed in 1792. Will architects please note that he was presented with a silver cup for having completed the building considerably below his estimates! The Hall contains a fine ballroom in the Adams style.

The parish church, about to become the cathedral church, dedicated to St. Mary, is mainly Perpendicular. The church appears to have fallen into decay and to have been rebuilt in the fifteenth century. An inscription which used to be visible in the south wall of the nave ran thus:—



DANBURY CHURCH, ESSEX, FROM SOUTH WEST.

"Pray for the good estate of all the towneshepe of Chelmsforde that hath been liberal willers and procorers of helpers to thys work, 1429."

We are indebted to Morant for the following:—"The east window of the chancel was very fair and curiously painted. The history of Christ from His conception to His ascension, untouched, as supposed, from the first foundation of the church. In August 1641, an ordinance of Parliament being made for taking away all scandalous pictures out of churches, the churchwardens took down the pictures of the Virgin Mary and of Christ on the Cross and supplied the places with white glass; but the mob not thinking this a thorough restoration enough, a great number of them assembled on the 5th of November in a rioutous manner, and with long poles and stones beat down and defaced the whole window." But this disaster is small beside that of the evening of January 12, of the year 1800, when zealous gravediggers having undermined one of the columns of the

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nave, the whole of the south arcade with clerestory and roof collapsed. Curiously enough the steeple of the neighbouring church of Writtle fell about the same time.

"Chelmsford church and Writtle steeple fell one day, but killed no people." Johnson of Shire Hall and silver cup fame may have been an unimpeachable Classic architect, but he lived before the great days of the Gothic revival, and his rebuilt nave is execrable. Still the tower and the south porch remain intact; their subsequent restoration has been well effected, and with the chancel they are by far the most interesting part of the church. A theological library is well housed in the parvise over the porch. The date of the lead spire on the tower is 1749. The curious double arch on the north side of the chancel is an almost unique feature.

A host of the Mildmay family lie in a vault under the church. The splendid Jacobean tomb to Thomas Mildmay is dated 1571.

A word for the inns of Chelmsford. Among those of old foundation are the Black Boy, the White Hart, and the Saracen's Head. The latter was in existence in the fifteenth century, though its present structure may not be ancient. Anthony Trollope stayed here when hunting with the Essex pack, and did his literary work in the smoking-room.

Great Baddow.

Great Baddow, now practically a picturesque suburb of Chelmsford, appears to have had a distinct history in the past as a town of some little size. In early times it was denominated "Badewen." Its spacious churchyard—I should imagine the "God's acre" is in this case a modest estimate—is said to have been frequently used as a meeting-place by seditious countrymen in the peasant rising of 1381.

At the time of the dissolution of the chantries it is described as "a great and populous towne, and the great part of theim dwell uplande and farr from the said church of Much Badowe, and having in yt about the nombre of fower hundryth of howselynge people and more."

Baddow was the birthplace of Richard de Baddow, founder of University Hall, now Clare College, Cambridge. Alexander Barclay, the translator of the "Ship of Fools," held the vicarage in 1546.

The church, dedicated to the Virgin Mary, consists of nave, chancel, double aisles, and tower. Probably no part of the present building is of earlier date than the fourteenth century. The tower is distinctly picturesque with its huge ivy roots and covering, apparently of great age. The north aisle is of interest with its great oak responds 14 inches wide and roof reminiscent of the fine carpentry of Margaretting, Ongar, and other Essex churches. The pulpit is a good Jacobean specimen, dated 1639, and very complete, with back and sounding board intact.

The clerestory is, in my opinion, one of the most remarkable examples of brick architecture in the country; I know of no other example of brick tracery with cusping quite of this character.

(To be concluded.)

AN ANALYSIS OF THE REPORT OF THE PISA COMMISSION ON THE LEANING TOWER.

By William H. Goodyear.

Synopsis of an article in the *American Architect* of September 28.

THE recent widely published and alarming announcements of the probable downfall of the Leaning Tower of Pisa are due to the report of an Italian Commission, which was published on July 6. This report announces that the tower has moved 20 centimetres (8 inches) since 1829, and that the Commission has been unable to determine whether this movement is recent and progressive, thus inspiring grave fears as to inevitable or speedy downfall, or whether the movement is of older date and, therefore, owing to some special cause, such as an earthquake, not now in operation.

In this latter case no cause for present alarm would exist.

The Commission declines to express an opinion as to these alternatives, and the more alarming one has, naturally, determined the nature of most of the numerous notices which have appeared in the press.

The speedy downfall of the Leaning Tower has been almost universally feared, and anticipated, by the press of Europe and of the United States.

The special cause for anxiety has been a double reservation on the part of the Commission as to the date of 1859, when Rohault de Fleury published his *Monuments de Pise.*

The Commission has announced, for instance, that an inclination of at least 7 centimetres (about 3 inches) has certainly occurred since that date. As no later examination of inclination has been made before the present report, this leaves the question open as to whether these 7 centimetres of inclination may not belong to a movement which is now in continuous progress.

The Commission has also suggested, without deciding the point, that the 13 centimetres additional inclination, making up the entire 20 centimetres (or 8 inches), may also be of recent occurrence.

The *American Architect* of September 28 appears to have completely removed all cause of fear as to the fate of the Leaning Tower, by proving that the figures of the Commission are woefully in error. The proof is offered that the Tower has moved 30 centimetres more than the Commission has supposed, and that this movement had taken place before the date of De Fleury's publication of 1859.

The actual movement is found to have been one of 50 centimetres, not of 20, but this movement, which was probably caused by the earthquake of 1846, certainly occurred before 1859.

Not only are the figures of the Commission found to be a mass of errors, on their own testimony, when these figures are compared and tested by their own supposed results; but the special cause, as well as the general cause, of these errors has also been determined.

The following announcements are made as to these errors, and the proofs that they exist are offered by computations which are published in detail, and which can be tested by every reader.

The Commission's supposed rate of inclination per metre in 1829 is 86½ millimetres. The real average rate was 84 millimetres.

The supposed present rate of inclination per metre is announced by the Commission as 92 millimetres. It was really 94½ millimetres in 1859.

The Commission announces 20 centimetres additional inclination between 1829 and 1910. There was really 50 centimetres additional inclination before 1859.

The Commission announces the rate of increase per metre, between 1829 and 1910, as being 5½ millimetres. Therefore, if we divide the supposed increase of 20 centimetres by the rate of increase per metre, we ought to obtain the axial height on which the increase was figured, viz. the axial height of the tower. *But when this division is made, the resulting axial height is only M.63.36, which is the axial height, according to Cresy and Taylor, of the six storeys above the first, thus leaving the entire lower storey, which is nearly one-fourth of the axial height, out of the computation.* (The height usually plumbed is seven storeys, excluding the upper storey or bell chamber, because it is of smaller diameter and consequently does not overhang.)

These various discrepancies naturally call for some explanation as to how these remarkable errors were made, and that explanation has been determined.

The fundamental and original cause of error in the report of the Commission was its self-confessed failure to examine the text of the original work on which it relied for the inclination of 1829. This book (by Cresy and Taylor) could not be obtained in Pisa, and the Commission, according to its own confession, did not send one of its members to examine a copy in some library outside of Pisa. There are at least five copies of Cresy and Taylor in New York City, and it appears likely that some library in Italy must have a copy, as it is not a very rare book.

In any case, the library of the British Museum could easily have been consulted.

Instead of following this course, the Commission relied on an Italian authority for its information, at second-hand.

This authority was a Pisan engraver, Ranieri Grassi, who had re-engraved and republished Cresy and Taylor's plates in 1831; *but Grassi did not translate their text or even derive his own computations from it.*

The plates were well reproduced, but they copy some errors of transcription in the original and they are not self-explanatory. The explanations and descriptions in Cresy and Taylor's text are essential to correct estimates of the inclinations. These cannot be computed directly from the figured plumbs on account of the variations in the projections of the various cornices and surfaces of the Tower, and also on account of the variations in the lower and upper diameter of its interior well. (The Tower consists of a thick tubular wall containing a spiral stairway and surrounding a hollow interior or well.)

Thus the estimates of inclination which were independently made and published in Grassi's text, with the

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Cresy and Taylor re-engraved plates, are unauthentic and misleading, and quite useless when comparisons with publications or observations of later date are in question.

The Italian authority of 1831, for instance, states the exterior inclination at 48 centimetres (or 19 inches) more than the estimates of Cresy and Taylor's text, which are based on the same plumbs. Grassi's statements as to exterior and interior inclinations make them vary by 91 centimetres (or 36 inches), whereas Cresy and Taylor announce them as equal within ¾ of an inch.

The resort of the Commission to a statement of inclinations by the supposed rate per metre was due to their wholly unnecessary ignorance of Cresy and Taylor's text and to their consequent inability to interpret or trust the unscientific and rule-of-thumb estimates of Grassi.

The Commission's rate of inclination per metre for 1829 was obtained from a six-storey interior plumb by Cresy and Taylor, which Cresy and Taylor did not themselves think it worth while even to describe (a special plumb for a partial height of the tower). The amount of this plumb is the only one directly entered on the plates with a total figure.

Hence the Commission's choice of this plumb as a basis for computing the inclination of 1829.

But both Grassi and the Commission forget to consider that the varying diameters in the well of the Tower involve a correction, and addition, of 20 centimetres (or 8 inches) before the given plumb can be figured as a true record of inclination.

The investigation which has determined the inaccuracy of the Commission's methods and results was originally suggested by the unusual, and hitherto wholly unknown, method of stating the inclination of the Leaning Tower of Pisa by the rate per metre.

For Rohault de Fleury discovered in 1859, that the Tower has a continuous bend toward the perpendicular above the first storey. This bend is produced by successive increments of height in the galleries on the overhanging side. The floor of the eighth storey is thus 86 centimetres (or 34 inches) nearer to true level than the base, and the entire bend amounts to 30 centimetres (or one foot).

It follows that the inclination of the Leaning Tower varies at every storey, and that no average rate of inclination can be specified which applies to any given storey or to any given *partial height*. Thus, even if the Commission had not been in error by 8 inches as to the sixth storey inclination in 1829, its rate per metre would still have been in error as applied to the entire height.

A true general average of inclination in the Pisa Tower can only be obtained by dividing the total inclination by the total height, but when these true totals are known (and, of course, the height is always known), this division is unnecessary.

Therefore, the method of stating the inclination of the Tower at so many millimetres per metre is, apparently, imposing, but really pretentious, unnecessary, and misleading.

It was the remarkable absence of all estimates for total inclinations in the report of the Commission which first led the author of the *American Architect* article to consider the figures of the report as being open to doubt. For no total inclinations are mentioned in the report, either for 1829 or 1910.

Thus, the only possible basis of an estimate for average rates of inclination is not mentioned. This circumstance was regarded as suspicious.

The statement that no total plumb has been quoted for 1910 may be qualified by the reservation that there is no such statement for 1910, unless a twice-repeated error *of one metre* (or 39 inches), either in proof or transcription, has been made in the report.

The only plumb or measure of inclination mentioned as taken by the Commission is said to have been "between the first and seventh orders," and the amount is said to have been 3 metres and 26 centimetres. The words "between the first and seventh orders" might be interpreted to mean "between the bottom of the first and the top of the seventh storey," if the amount were stated to be 4 metres and 26 centimetres. But in this case De Fleury's inclination must have been underestimated by 31 centimetres, so that the hypothesis does not benefit the Commission.

At all events, it is beyond debate that the figures of the Commission underestimate the present total inclination by 30 centimetres (or 12 inches), and it is beyond debate that an increase of 50 centimetres (or 20 inches) had occurred between 1829 and 1859. Eyewitnesses of the earthquake of 1846 in Pisa are known, on the authority of a great geologist of that time, to have reported that the oscillations of the Tower during that earthquake "were a terrible sight."

The quoted article in the *American Architect* is now being translated into Italian by Dr. Luigi Roversi, a distinguished Doctor of Letters of the University of Bologna, now resident in New York, formerly editor of the *Progresso Italo Americano*, and Chief United States Commissioner at the Turin Exposition of 1902.

INTERNATIONAL TOWN PLANNING EXHIBITION.

An extremely important adjunct to the Town Planning Conference next week will be the Town Planning Exhibition at the Royal Academy. This is to be opened by Mr. Leonard Stokes, P.R.I.B.A., at 12.30 P.M. on Monday morning, that is to say, three hours before the inaugural meeting of the conference at the Guildhall. The exhibition is to be on such a scale as to fill the many galleries at the Royal Academy, and it will continue during the entire week following the close of the conference. This latter fact is important, as it happens by chance that during the second week the principal railway companies all over the country have arranged special facilities for journeying to London. There is therefore every reason to hope that such a unique opportunity for studying the practical side of town-planning will be taken advantage of by architects, surveyors, and all others interested. The Exhibition sub-committee are as follows:—Professor S. D. Adshead, F.R.I.B.A.; Mr. Henry R. Aldridge (representing the National Housing and Town Planning Council); Mr. W. Curtis Green, F.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; Mr. Percy W. Lovell, A.R.I.B.A.; Mr. E. L. Lutyens, F.R.I.B.A.; Mr. Ian MacAlister, Secretary R.I.B.A.; Professor Beresford Pite, F.R.I.B.A.; Sir A. Brumwell Thomas, F.R.I.B.A.; Mr. C. Harrison Townsend, F.R.I.B.A.; Mr. Raymond Unwin, Hon. Secretary.

The nucleus is formed by the chief exhibits shown at the Town Planning Exhibition held in Berlin in June last. This exhibition, of which an illustrated account appeared in our columns, proved a phenomenal success, and was visited by over 65,000 persons. Germany, as the leading nation in modern town planning, will in consequence be very exhaustively represented. The cities of Munich, Cologne, Düsseldorf, Nuremberg, and many other growing industrial towns are sending plans, sketches, and models illustrating the way in which they are dealing with the rapid extension of their urban districts, and with the difficult housing problems accompanying such growth. The industrial town of Essen, the seat of the Krupp Works, one of the largest industrial undertakings in the world, has made exceptional efforts to house its population in a healthy manner and to break away from the block system characteristic of so much German housing. It is hoped that Messrs. Krupps will also exhibit models of some of their industrial colonies.

The city of Ulm, which is famous in Germany for its traditional adherence to the cottage type of dwelling, owing to the far-sighted policy of Oberbürgermeister Wagner in purchasing and dealing with sufficient area of land to control the character of the city's development, is sending a very full exhibit illustrating its methods of work. The city of Frankfurt will show its methods of dealing with the opening out of old, congested areas, and of executing town-planning schemes by means of rearranging the boundaries of ownership, which in many German districts are a great difficulty owing to the minute subdivision of land.

Special interest is attached to the four plans contributed by the municipality of Rome, as illustrating its development from 1866-1909. The first shows the Eternal City in 1866, before the Italian Union, when most of the inhabitants were living outside the city and near the Tiber. At that time the chief artery of modern Rome, the Via Nationale, had hardly been commenced. The first extension and the first regular plan was prepared four years later. In 1890 another plan was prepared for dealing with the rapidly rising new district. Next one was required for dealing with the increasing population in the oldest quarters. This last year received the royal approval, and completes the set of four sent by the authorities. From the city of Milan comes an example of an Italian garden city and other exhibits.

Paris will be well represented. The Prefect of the Seine has sent a series of plans both ancient and modern, illustrating the development of the city of Paris, and showing the great town-planning works carried out at different periods, including those under the supervision of Baron Haussmann, and also showing the works now contemplated to complete the schemes prepared by Haussmann and to carry out other

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necessary improvements, the whole forming part of a great scheme for the improvement of the city of Paris, for which the City Council have sanctioned a total expenditure approaching 36 millions sterling.

Nancy, Havre, and other French towns will be represented by exhibits, and plans will be shown of the great parks—Versailles, St. Germain, &c.—so characteristic of eighteenth-century France.

Reference has already been made to the extensive German exhibit. This will include the premiated designs in the great competition recently held for the planning of Greater Berlin which are of unique interest, especially to all those connected with London and our greater cities, as these schemes deal comprehensively with the central traffic problems connected with the development of a great city, as well as the development of the external area.

America's work will also be well represented. From Chicago has come the great series of beautiful drawings made by Mr. Burnham for the improvement and development of that thriving commercial centre. These drawings are of unique interest, and display not only most beautiful draughtsmanship, but one of the most comprehensive schemes for dealing in an entirely modern way with the development of a great city, its harbours, railways, parks and buildings. Other American civic and educational centres will be illustrated, as well as the system of parks and parkways which are becoming such an important feature in their modern city development.

There will be a diverse display of work already carried out and in contemplation in this country. Edinburgh sends a collection of original drawings illustrating one of the few examples of comprehensive town planning that we have in Great Britain; while Professor Geddes is arranging a special series of drawings and models illustrating the development of Edinburgh and the method of conducting the city survey. The plans include an original plan of the new town of Edinburgh as prepared by Mr. James Craige, architect, in 1767.

The English garden city and suburb development will be fully illustrated by models and drawings of Letchworth, the garden suburbs of Hampstead, Ealing, Harborne, Bournville, Port Sunlight, Rosyth, and others, while the Co-partnership Tenants' garden suburbs and villages will be well represented.

Mention might also be made of a scheme for suburban development suggested by the Town Planning Act which has been contributed by the Manchester Society of Architects.

We are informed that the exhibition will include upwards of 1,000 plans and many models illustrating the growth of cities, ancient and modern; types of town planning; the development of suburbs, garden cities, and villages; the architectural treatment of streets and places; and the laying-out of parks, open spaces, and playing fields. It is evident that the Royal Institute of British Architects have succeeded in bringing together an exhibition which represents the best work all over the world, and one that should attract a large number of visitors to Burlington House.

A STUDY OF BASE AND BEARING PLATES FOR COLUMNS AND BEAMS.*

By N. CLIFFORD RICKER, Professor of Architecture, University of Illinois.

(Continued from last week.)

IX.—METHOD OF APPROXIMATION.

As cast-iron plates are generally made with thick edges, the practical application of the last formula is quite tedious. In order to apply it, it becomes necessary first to assume the thicknesses t, t' and t'', then using the preceding formulas to determine the corresponding safe resistance moment of the fracture section. This process must doubtless be repeated several times before a plate is found which has the required safe moment of resistanec of section. Hence the necessity for a simplification of the method by directly obtaining the required values of the thicknesses t, t' and t'', which is accomplished in the following manner.

By the formula for a rectangular fracture section, the values of

$$\frac{I}{c} = \frac{bt^2}{6} = \frac{kt^2}{6}(2n+1) \qquad (9)$$

are computed for $n = 0$, $n = 1$, $n = 2$, $n = 3$, $n = 4$, $n = 5$, and these values lie in a straight line, when they are plotted as in the uppermost line in fig. 15.

By formula (7) for tapered plates with sharp edges, are next computed the values of $\frac{I}{c}$ corresponding to $n = 0$, $n = 1$, $n = 2$, $n = 3$, $n = 4$, and $n = 5$. These values are then plotted in fig. 15, forming the slightly curved and dotted line, next to the lower straight line. Joining the ends of the curve by the straight full line, this is found to almost coincide with the curved line, for which it may be substituted with a slight error on the safe side.

Similarly for $n = 5$ only, $\frac{I}{c}$ is computed for edge thickness $t' =$ 0.1 t, 0.2 t, 0.3 t, 0.4 t, 0.5 t, 0.6 t, 0.7 t, 0.8 t, and 0.9 t. These values are laid off on the vertical for $n = 5$, and straight radial lines are drawn to these points in fig. 15. The corresponding per cents. of resistance may then be easily computed for $n = 5$,

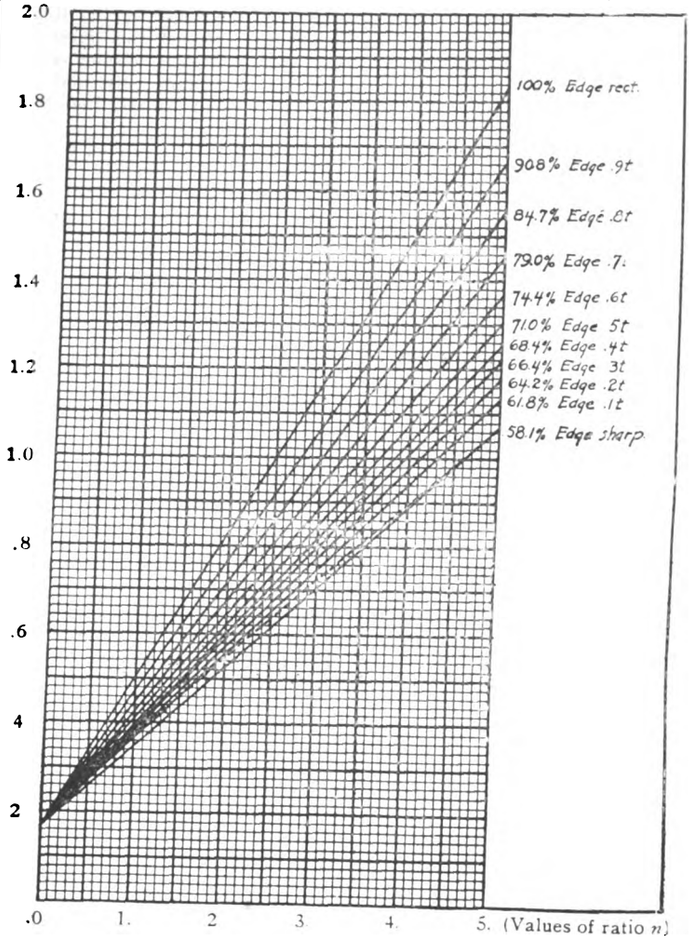


FIG. 15.

as written in fig. 15, and which signify that the resistance moment of a tapered fracture section is a certain per cent. of that of a rectangular section of equal thickness, only for $n = 5$.

(To be continued.)

* From a publication by the University of Illinois Engineering Experiment Station.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) has devoted two numbers to the exclusive presentation of the work of single firms of architects—first, Messrs. Alden & Harlow; second, Messrs. Albert Kahn & Ernest Wilby. The buildings by the former include the Second National Bank, the Newsboys' Home, and a retail store building, all at Pittsburgh, Pa.; whilst Messrs. Kahn & Wilby's productions are domestic buildings in Michigan and Ontario, the Canadian Bank of Commerce, Halifax, Nova Scotia, and additions to the University of Michigan.

La Construction Moderne (Paris) has made a special feature of a further instalment of its account of the remains of Old Paris, and now gives illustrated descriptions of L'Hôtel de Bretonvilliers and La Place des Victoires. Other illustrations are of a prize design by M. G. Mauxion for a royal residence on an island in a lake, and a block of flats in the Rue Georges Saché, Paris, of which M. P. Vasseur is the architect.

Stone (New York) gives as specimens of stone buildings the Meeting House of the Society for Ethical Culture, New York, of which Mr. Robert D. Kohn is the architect, and the

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entrance doorway to the Gallery of Louis XII. at the Château de Blois. Our contemporary continues its crusade against concrete by perfectly legitimate descriptions of undoubted failures of concrete constructions which are worthy of attention by all intending users.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Town Planning Conference.

Sir,—The Town Planning Conference, which will open in London on October 10, has been convened by the Royal Institute of British Architects to consider the questions involved in the improvement and extension of our cities, with special reference to the artistic and constructional problems involved. Membership is open to all, including ladies.

Not the least interested in this important subject are the many who prefer freedom and private enterprise to the drastic methods of State interference, and it is therefore to be hoped that individualists will make themselves heard on the occasion.

London affords an admirable example of a city which owes much to private enterprise, for we are indebted to the generous planning of individual owners for the great squares which are so distinguishing a feature of the Metropolis. So much is this the case that I venture to assert that not one of these garden spaces can be pointed to as the outcome of planning on the part of a public authority. The facts with regard to the London squares should be carefully considered at a time when so many seem to believe that the only road to improvement is by way of State interference.—I am, &c.,

Mark H. Judge, A.R.I.B.A.

7 Pall Mall: October 1, 1910.

T-Squares.

Sir,—Will any reader of your valuable paper kindly let me know whether celluloid-edged T-squares are used by architects in preference to the ebony ones, as I see these celluloid-edged ones are recommended by drawing-instrument makers? Also is the celluloid set-square much used by architects, or do they prefer vulcanite ones, or framed? Are needle-pointed drawing instruments worth the extra cost over plain ones from an architect's point of view, and whether the hair-spring divider is worth the extra cost over the plain one?

I shall be greatly obliged by any information from users of these instruments, as I may want to purchase; and when I do I should like to have the best and most useful.—I am, &c., Student.

[We personally use celluloid-edged T-squares and celluloid set-squares in preference to any other. Needle-pointed instruments and hair-spring dividers are certainly well worth their extra cost.—Ed.]

The House and Cottage Exhibition of 1911, Gidea Park.

Sir,—The notice contained in your advertisement columns calling attention to the last day for submitting designs for the houses and cottages to be erected in Gidea Park for next year's Exhibition should not be overlooked by architects and builders.

The Exhibition will undoubtedly be the most important exhibition of the kind yet held in this country; architects from all parts of the United Kingdom will compete, and the Coronation festivities will bring an enormous influx of visitors to London from all parts of the country just at the time the Exhibition is being held.

Some criticism has been expressed by architects of the necessity imposed on them of actually building a house or cottage. Without this condition the Exhibition would, of course, be impossible. The public want to see houses and not plans. Above all, they want to see something better than the streets of unlovely houses which have been growing up round London in recent years.

There is no doubt that English architects can give them what they want, and this Exhibition offers a unique opportunity of showing what architects' houses can be and ought to be like. The financial assistance offered to competitors is on the most generous scale (no less than nine-tenths of the building cost being advanced on approved designs), and the fact that any house approved by the judges and erected in the Exhibition will necessarily be inspected by thousands of possible purchasers offers advantages to the intending builder which cannot usually be obtained.

It is to be hoped that the opportunity of improving the standard of suburban architecture will be taken full advantage of, and that the generosity of the promoters of the Exhibition will meet with an adequate response.—Yours truly, The Exhibition Committee.

Housing, Town Planning, &c., Act, 1909.

Sir,—The last Finance Act has proved how seriously the burden of officialdom is increasing in this country. We may, we trust, be permitted to show how the Housing, Town Planning, &c., Act, 1909, has also added to the burden.

We are concerned for Mr. W. Arlidge, who for some ten years has owned three houses of modern construction in Camberwell, each divided into three self-contained flats. All the tenants have been in occupation for many years. Mr. Arlidge has been in the habit of repairing his properties between April and June in each year. On February 11 last, however, and again on February 23, he was served by the Camberwell Council with notices under the Public Health (London) Act, 1891, dealing with a few trivial repairs involving an expenditure of about 10*l*. on the three houses. On March 18 he agreed with the sanitary inspector as to what was to be done, and the work was put in hand and completed by April 9.

Notwithstanding the completion of the work, the Council on April 13 made orders under the Housing, &c., Act, 1909, prohibiting the use of the houses for human habitation as being "in a state so dangerous or injurious to health as to be unfit for human habitation."

Under the Act the only remedy against such orders is by way of appeal to the Local Government Board. The Board can either dispose of the matter in a summary way or can direct a public local inquiry. Notice of appeal was given on April 29 setting out the facts, and at the time the Board was pressed to view the property and deal with the matter summarily. This, however, the Board declined to do, and instead directed a public local inquiry before one of its inspectors—a layman. Placards announcing the inquiry for June 15 were posted at the town hall and elsewhere. The wording adopted might well be the foundation for an action for libel.

As the inquiry was the first held in London under the Act, Mr. Arlidge retained Mr. Horace Avory, K.C. (now Mr. Justice Avory) as his leading counsel. The proceedings were protracted over three days (June 15, 23 and 27). The Council tendered the most minute evidence, including evidence quite irrelevant to the inquiry, but which the inspector decided was admissible. The inspector took every word, including the speeches of counsel, down in longhand. He unfortunately did not see his way to accept an offer we made to furnish him with a transcript of the shorthand notes taken by one of the recognised writers to the Courts.

On September 26 the Board made an order quashing the closing orders and directing the Council to pay the Board's costs. The Board, however, having under the Act a discretion to allow costs "as they think equitable," refused to allow Mr. Arlidge any parts of the costs he had incurred.

The conclusions to be drawn from the procedure adopted are:—

(1) That owners can have closing orders made against them without an atom of justification.

(2) That the Local Government Board, apparently with the desire of supporting the local authority and discouraging appeals, refuse to exercise the powers they possess of dealing summarily with an appeal.

(3) That the public inquiry is an engine of oppression on an appellant by reason of

(*a*) The placards issued locally suggesting that the appellant lets houses notwithstanding that they are "unfit for human habitation." (*b*) The heavy expense entailed in appealing against orders which, if allowed to stand, might seriously imperil an owner's reputation. (*c*) The length to which the hearing can be protracted by the fact that the inspectors are laymen quite without any judicial experience. (*d*) The denial of justice, resulting in the fact that, although the Borough Council are proved, as in our client's case, to be throughout in the wrong, the Board can wilfully and without any reason deprive an appellant of his costs.

The facts stated above are, we think, sufficient to justify the hope that the necessary pressure will be brought to bear in the right quarter, so as to give owners a properly constituted judicial tribunal and prevent the recurrence of such a scandal as that to which we have ventured to call attention.—We are, sir, your obedient servants,

Rubinstein, Nash & Co.

5 & 6 Raymond Buildings, Gray's Inn, London, W.C., October 5, 1910.

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The Architect.

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FORTHCOMING EVENTS.

Friday, October 14.

Town Planning Exhibition at the Royal Academy : Open till October 22.

Monday, October 17.

Liverpool Architectural Society : First Members' Meeting of the Session.

Tuesday, October 18.

Institution of Heating and Ventilating Engineers : Mr. Fredk. Dye on "Fuel Consumption," Mr. C. R. Honiball on "The Humidity of Air."

Thursday, October 20.

University College, London : Third of a course of public lectures on Town Planning, by Mr. H. V. Lanchester, "Possibilities of the Future."

Monday, October 24.

Architectural Association : Mr. Edwin Gunn on "The A.A. Excursion to York and District, 1910."

THE TOWN PLANNING CONFERENCE.

Monday, October 10.

The Inaugural Meeting.

THE inaugural meeting of the Conference was held at the Guildhall on Monday afternoon. The proceedings were opened by the Right Hon. the Lord Mayor giving an official welcome on behalf of the Corporation.

Mr Leonard Stokes, previous to returning thanks, said he would like the meeting to co-operate with him in sending a loyal telegram to His Majesty King George. Referring to their debt of gratiude for the loan of the Guildhall and for the presence of the hard-worked Lord Mayor and Lady Mayoress, Mr. Stokes mentioned the fact that the maiden name of the Lady Mayoress was Pugin.

The Lord Mayor then left the Guildhall to preside at the first committee meeting of the King Edward Memorial Committee.

Mr. Leonard Stokes then gave the following address :—

It is my privilege now, as your President, to make a few remarks before calling upon Mr. Burns to deliver his inaugural address. To begin with, I should like to say how much we members of this Conference have to be thankful for. We are under Royal patronage, we have been fortunate enough to secure the use of this splendid old hall for our opening meeting, and the Lord Mayor and Lady Mayoress have shown their interest in this question by attending in person. Next, we have the Right Hon. John Burns, M.P., President of the Local Government Board and our Hon. President., here to-day, and he will make us, I know, a great speech. It is Mr. Burns and his Town Planning Act that have made this meeting possible, and I feel sure that in his address he will show us how best to take advantage of this most useful Act now that it is in force, and no one else could do this half so well as Mr. Burns. Again, owing to the large-minded policy of the Royal Academy of Arts in lending us their splendid galleries in Burlington House we have been able to get together an exhibition the like of which has never been seen in this country, if, indeed, in any other. And lastly, we have behind us the funds, premises, and experience of the Royal Institute of British Architects, and a little band of zealous workers to whom we owe more than any words of mine can adequately express. We are also very grateful to a number of foreign countries and cities for responding so generously to our demand for co-operation and for lending us the plans of their various great schemes, a number of which will open the eyes of many here present—even, perhaps, those of our Hon. President himself. And we must not forget either to give a hearty welcome to our foreign members and to the representatives of many great corporations and important societies.

Perhaps the greatest good will come from the exhibition of plans, &c., which will be open to the public also, at Burlington House. It is to be hoped that we English will not stand with our hands folded whilst other nations are doing so much.

Town planning must be of interest to all citizens, but it is particularly interesting to us, as we are not only citizens, but also expert citizens, and it is to us as experts that this Conference appeals particularly, as we trust that from it good may come in many ways. First, however, we, the expert citizens, have to learn how best to deal with the various complex matters connected with the subject. And then we have, perhaps, the harder task of convincing our non-expert fellow-citizens that it is to their advantage that the improvement decided should be carried out. Of course, we architects think that Mr. Burns's Bill did not go quite far enough, and we should like to have seen some more precautions taken to ensure effective planning from an architectural standpoint. Probably Mr. Burns felt that as we architects should have a good deal to do with the preparation of plans under his Act, it would be our fault if these plans were not all that they might be. The public are beginning to grasp the fact that buildings can be well planned and well designed throughout, and so give greater comfort and pleasure to their owners without adding to their cost. What applies to buildings applies equally to streets and towns. At present towns are only popular with the poor, who flock in large numbers into them, whilst the well-to-do, or as many as are able, all flock in the other direction. May not this be because our towns are thoughtlessly laid out and badly arranged as places to live in with comfort and without injury to health? It would be obviously to the advantage of owners of town property if people were keener to live closer to their work. And we argue that if towns were made more attractive and healthy in themselves people would gladly live in them, and so save the time and expense now involved in getting to and fro from their work, shopping, schools, and theatres. Why is Paris always so popular? It is largely due to the fact that it is well laid out. Humanity is very sensitive to surroundings. Open up vistas, plant trees and fountains, give us light and air and music, and you will not recognise the next generation. How this is all to be done may require some consideration; but create a healthy demand and the supply will follow. If every town had a regular improvement rate and a well-considered plan, which is now provided under the Act, improvements might be carried out quietly and regularly and as opportunity arose, and without the trouble and expense of going constantly to Parliament. A walk round the Exhibition will show what other countries and cities are doing; and what others can do I hope we can.

Architects know that the lay-out or plan of a town is the very essence of its success. You may place any number of fine buildings in poorly arranged streets without producing a fine town. This so far has never been really understood in England, where we are much too prone to be little in our thoughts and methods, and to shut our eyes to the most obvious improvements or developments; and so long as we can wriggle along from one place to another we put off taking the bull by the horns, which would seem to be the most businesslike thing to do if only we really were a business-like people. The first cost is also allowed too often to govern our decision, and, instead of thinking only of the best, we try only for the cheapest. As we are meeting to-day in the largest and richest city in the world, I should like to ask the Corporation of this city—whose guests we are—if I may do so without offence, to most carefully consider the lay-out of the great new bridge which they are about to build across the Thames. I know it is intended to have the bridge itself properly designed, but the approaches to a bridge are as important as the bridge itself, and it is these approaches which I fear have been treated with more regard to economy than to the fine effect which such a great work demands. I know all here present will join in asking that, before it is too late, the best expert advice on this subject may be obtained.

Improvements, to be real improvements, should, of course, be thought out by the right people, who should never forget to keep at least one eye on the future. If the police, however, are to design improvements, as I understand has lately been practically the case in London, then the Chief Commissioner must attend a course or two of lectures on civic design and study town planning under competent direction. The proper regulation of traffic is one thing, and a most important thing; but it is not everything, as we can easily see to our cost by looking at the recent Hyde Park Corner improvement. Again, improvements should

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form part of a comprehensive scheme, and should not be isolated efforts which may have to be dealt with again by our children unless we look well and carefully ahead. A simple example may be seen going on at the moment in Westminster. One end of a street—its wider end, too—is now being made wider, as recommended by the recent Traffic Commission, I believe, whilst at its narrower end a huge building is being erected to the old frontage line, which thus will effectually prevent the widening of the street at that end except at enormous expense.

We naturally are very proud of our free country, even with its happy-go-lucky ways. But in towns we really sadly want a benign despot to say, "This thing is wanted, and shall be done," and "That thing will become necessary before long, and must be provided for." The Town Planning Act goes some way in this direction, but only in a permissive manner, and my despot is omitted. If we cannot have my despot, then how anything short of the municipalisation of the necessary land is ever going to get us out of the difficulty I fail to see. Without it we have so many conflicting interests to deal with; with it we should have but the common good to think of. Without it the expense is often prohibitive; with it this difficulty would largely disappear. Without it an awful effort is necessary every time a step has to be taken; with it every step would be a pleasure. However, the new Act is undoubtedly a great step in the right direction.

The Inaugural Address

By the Right Hon. John Burns, M.P.

Mr. John Burns, M.P., the President of the Local Government Board, as Honorary President, welcomed the Congress on behalf of the Prime Minister and His Majesty's Government, to the beautiful Guildhall. He also most sincerely thanked the Royal Academy for lending their galleries for what he considered the most humane and useful exhibition he had ever seen within the walls of Burlington House. When he had looked around at the previous exhibitions everything had seemed to him vanity and vexation of spirit; whereas this latest one far transcended in dignity and completeness anything of that character he had ever seen. They welcomed the Conference to the city which Wren had beautified with his fifty-five churches, a great cathedral, and Chelsea and Greenwich hospitals. As a humble layman he might say Wren was not merely in many respects our greatest architect, he was also a master-builder, of whom the British race could be reasonably proud. They welcomed the Conference to a City which had evoked the enthusiasm of William Blake, Milton, and William Dunbar. Coming to the purely engineering side of London, there were some magnificent structures worthy of the greatest men of any country and of all time. They could see Rennie's Waterloo bridge. This was so grand, so beautiful in its scale and poise that Canova declared it was worth coming from Rome to see merely a single arch of it. Then there was Bazalgette's Embankment, beautiful from the artistic, architectural, or engineering point of view. The efforts of the London County Council to make even their tunnels as artistic as might be should not be overlooked. Then there was the work of Mr. Robson and Mr. Bailey on the School Board's schools; and that of Mr. Riley and his splendid staff, most especially in the fire stations that are now being erected all over London. The best time to see the beauties of London was in the early morning, at sunrise. In his own time, said Mr. Burns, he had seen London become, thanks to architects, a finer, a cleaner, and a more noiseless city, and one which some other nations would do well to regard.

The question for the ratepayer was whether he got value for the twenty-five millions sterling spent upon the government of the City. Mr. Burns said that he believed, in view of the improvements effected, that the citizens got value for money; their investment was one of the wisest that could be made. He did not think it dawned sufficiently upon the average citizen what was the effect of structural environment—good buildings and pleasant homes—upon the character, temperament, will, disposition, and energy of the people. He hoped to be the "guide, philosopher, and friend" of the delegates in their visits, and he believed that in some of the buildings they would see embodied the traditions and best qualities of our race. It was a devotional exercise to walk from Whitehall by way of Norman Shaw's New Scotland Yard to Westminster Hall, the ancient House of Commons. There was all the witchery of Westminster with its wonderful abbey and the spacious dignity of the wonderful hall. It was only necessary to see the building to understand the effect of such environment on men, and, above all, the history that there is in a building like that for the boys and girls who will be our future town planners. They found there history in tabloid. Alternately palace and prison, Parliament Hall and justice seat, nowhere in the world could there be seen a greater or more magnificent and dignified building than Westminster Hall.

In London they could see 400 garden squares, gardens, and crescents, some open, some closed, but all accessible to eye and ear, the happiest, healthiest, luckiest bits of town planning ever done, inspired by enlightened, self-interested, private owners, and here and there an æsthetic duke, marquis, or earl, who had given to London a priceless heritage, and the public authorities responsible for London's development must do everything in their power to secure every square yard and blade of grass therein. He would say that in no small measure the depth and breadth of English law, the respect which it invokes in every country in the world, is in no small measure due to its environment, to its Inns of Court, its public schools, colleges, and meeting-places.

Mr. Burns said he mentioned these venerable and beautiful buildings not as mere structures in brick and stone. Cities were not merely emporiums for goods, centres for commerce and trade; they were something more than a mere cash nexus, they were places where utility, comfort, and beauty could be and ought to be combined. The passer-by should feel something to which his sense of duty and sense of honour can respond to all the better for having lived in and near beautiful buildings every day of his life. The mean street produced the mean man, the tired woman, and the unclean children. Environment in youth was of enormous influence in the personal and civic education of the future citizens. Many people had given a reason why he was the author of a Town Planning Bill. They were all wrong. He would give the real reason. When he was an apprentice he used to eat his breakfast on a wall at Westminster, looking at Lambeth Palace and Wren's restoration of Cardinal Boniface's Library. At dinner-time he went to the cloister precincts of Westminster Abbey, and in his leisure he played in beautiful Battersea Park. That did more to produce years later a Town Planning Bill than all the criticism and the meticulous objections of all the gentlemen who thought they knew more about the Act than he did himself. He believed the people of the poorer towns suffered from poverty of spirit as well as lack of means. Some of them had made up their minds that the towns and districts where the money was made ought to be as cheerful as the districts where the money was too often foolishly spent. When a slum vanished, a brewery fell and public-houses disappeared. There was a greater reason than architectural symmetry (good though that might be), artistic appearance, or engineering interest in the town-planning scheme. Fifty per cent. of the total pauperism, 60 per cent. of its total cost are due to sickness. But if is impossible to avoid disease unless we let the sun and air into houses and streets. Motherhood, childhood, youth, society demanded the demolition of the soul-destroying slum.

Was it possible to get what they wanted? Let them look at what had been done. In England they had made great strides in connection with the town planning movement—greater strides, considering their ancient difficulties, than any other country in the world. And they ought to, because domestic architecture had been their pride. The architect has been able to provide good houses, pleasant and comfortable and beautiful, for the upper classes—"The stately homes of England, how beautiful they stand." The middle classes have in our western suburbs been well supplied with spacious and comfortable homes; if at times not actually beautiful, at any rate they are tolerable. Now the artisan was clamouring for something more than a mere hovel, something which will give his children better environment. At Bournville, Port Sunlight, Hampstead, and other places could be seen some of the most beautiful domestic architecture that could be found in any part of the world. The artisan was securing a home in Bournville, Port Sunlight, Tooting, Ealing, and many other places at a rent and of a character and a beauty which were not within the reach of the average artisan twenty-five or thirty years ago. But those who were lower than even the artisan—the great mass of mankind, the hewers of wood and the drawers of water—had to be thought of. Those responsible must see that the labourer was provided with infinitely better housing and street accommodation than he now secured. The great town planning movement must not end in a few cities getting all the talent, most of the money, and the best of the improvements. The East End wanted "West-ending" in its reconstruction. Wigan had got to be taken in hand as well as Westminster. Bermondsey needed it more than Belgravia. Every one of the local authorities is now provided through the

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Bill with the medium proportionate to their means of starting upon this new movement as soon as they dare. The expanding village needed it as much as the large city. Most of all, the straggling suburbs round the ever-changing cities give a stimulus. That call ought to have been answered years ago. For reasons industrial, social, commercial, and Imperial, town planning must go hand in hand with better housing, wider roads, higher wages, and increasing sobriety. Town planning was very belated, but it was not too late. If town planning was badly done through timidity or lack of imagination, it lay a burden for fifty or a hundred years upon progress, and paid seven or eight times over for their lack of prescience. Hitherto the mere owner without foresight had been really wasteful because he thought parsimony was economy. Therefore he had narrowed the streets, contracted the rooms, and looked upon a beautiful vista as the eighth deadly sin. That had got to be altered, and it was no use their pitching into Mr. Jerry Builder too much. Mr. Property Owner, who often unloaded on the jerry-builder and architect much of the responsibility he should take upon himself, had littered the earth with his squalid tenements and his ignoble streets. He believed that the landlords as well as the ratepayers would benefit if they did what the best architects were advising them to do.

Garden cities were magnificent in themselves, but they were a hundred times more useful in the inspiration they supplied to others. The property owner, who formerly threw the blame on others for his faults, was being taught a more excellent way. The Philistine was being taught that houses, roads and bridges might be made without loss of money to harmonise with beauty.

Mr. Burns said the reception of the Housing and Town Planning Bill had agreeably surprised him. He pleaded for it an indulgent trial, and if it could be, it would be amended and improved so that their object should be secured. What was their modest object? It was comfort in the house, health in the home, dignity in their streets, spaces in their roads, and a lessening of noises, smoke, smells, advertisements—all the nuisances that accompanied a city without a plan, because our rulers were governors without ideas, and our citizens without hopeful outlook and imagination.

In tackling this great job modern communities had little to learn which ancient ones did not teach them. Where in other times, for military or other reasons, the streets were narrow and the citizens crowded, compensation was given in large spaces, fine squares, and beautiful buildings. But we are confronted with greater difficulties than the ancients had to grapple with. We want the conscious ordering by cities of their social and economic growth expressed in architectural forms by the best men. We English were slow to learn some of the lessons from abroad. We were attached to a narrow utilitarianism which forgot that real Puritanism meant not a city of melancholy kill-joys, but private simplicity in cities.

The ancient cities did not have the burdens we now have. Athens did not have 600 miles of railway, as London had, on ugly viaducts, creating *culs de sac* of mean and poor streets, with 500 ugly railway stations spoiled by vulgar advertisements; it had no gasworks, and was without the 7,000 public-houses London possessed—nearly all of them at street corners, in positions which ought only to be occupied by banks, libraries, post-offices, and police-stations. But the measure of our difficulty ought to be the extent of our determination to grapple with it. Let them go up the Monument, look westward and see what Cannon Street Railway Station hid of the river and the city. He prayed when he was there that it might fall, as Charing Cross fell, only without hurting anybody. He suggested to the City that while they were building the new bridge, with St. Paul's as the centre of the vista, they should kill two or three birds with the same stone by getting rid of Southwark Bridge and placing Cannon Street Station on the Surrey side. (Cheers.) He was quite willing to draft a plan of it to-morrow. (Laughter.) He might go on and suggest a similar alteration in regard to the railway at Charing Cross for the benefit of the view from Westminster Bridge. Then they might have a new Waterloo Bridge, a replica of the present structure, but three times its width. One of the most gigantic artistic blunders to be met with in London was due to five or six artists in Chelsea, who were so anxious to see the brown sails of a barge just outside their studio windows that they prevented the construction of the Embankment from Battersea to Hammersmith. Immediately the Embankment was killed they got instead the four chimneys of the electric lighting station, which ought to have been down at Barking near the sewage works. It seems incredible that while in thirty years 550,000 houses have been built in Greater London alone, and 8,500 new streets 1,500 miles long, only twenty-three squares have been created. Every fifteen years 500,000 acres are abstracted from the rural domain in agricultural England for new houses, railways, factories and workshops. Fourteen or fifteen millions of money have been spent in rectifying mistakes which should never have been committed. Speaking of the exodus of people from the centre to the suburbs of London, he said that unless those areas co-operated with the London County Council and the City of London sensibly and in a neighbourly way, Parliament and the larger areas would be driven for their own self-protection twenty or fifty years hence to deal less liberally with those areas than would otherwise be the case. The great merit of the Town Planning Act was that both areas could join action, and, in conjunction with private owners, could commence at once as regarded the laying-out of districts. The Act had not been in effective operation more than six months, but already twenty-six local authorities were preparing schemes, and many other authorities were considering the application of the Act to their problems.

The owners of land were at this moment a bit too susceptible to panic. If they did not adopt in a sensible spirit the kindly suggestions in the Act, public opinion will come along and they will be less tenderly dealt with in the future than they were now under the Act. He was there to snatch them like brands from the burning, and to gather them in. He begged property owners to have only one example before them, and that was the precedent and kindly and neighbourly guidance of their own class 100 years ago in the garden squares in the West-end of London.

If it were asked what town plan an authority should adopt, he would answer that each nation should have its own way. The great charm of the R.A. Exhibition was that there was so much variety between the exhibits of the different countries. This country ought not to slavishly copy anybody. If he had his way, town planning would be applied rigorously and at once. But there was the layman to be considered. He who pays the rates and contributes to the taxes will have to pay for these several improvements. He is willing to pay because he knows that it is a good investment that has been too long delayed. Mr. Burns believed the Philistine and the economist could be converted if anyone would take the trouble to teach them. That Conference was the very best thing the London architects had ever done for the glory of their city and the dignity of their profession. He would ask how many architects were on the bodies of local authorities? They should speak to the people and popularise good housing, whether by means of lantern lectures or other ways. It was untrue that people were not amenable. Architects would have to put their shoulders to the wheel if they carried out the duties which fell upon their noble profession.

Sir Aston Webb and Dr. Stuebben expressed thanks to Mr. Burns for his address, and the meeting terminated.

The Town Planning Exhibition.

If the Royal Institute of British Architects had done nothing more than organise the Exhibition that is now on view and will remain open till October 22 in the galleries of the Royal Academy, a great and beneficial work would have been accomplished for the cause of improvement of town planning in Great Britain.

We in this country are novices in the science and art of town planning. We have blundered and muddled along in the primal disposition of our towns and in the haphazard addition of suburbs by the laying-out of estates upon the usual sole consideration of the creation of the maximum of ground rent. True that open spaces and squares have not infrequently formed part of the lay-out of building estates, but these are usually but a sop to the unfortunate occupiers of houses with the minimum of back yard.

Now we are all agog for town planning on improved and up-to-date lines, and hence the value of such an exhibition as that prepared for our instruction at Burlington House, by a careful study of which our town planners of the future may hope to be preserved from errors which have been committed and amended in other countries of Europe and America.

To attempt to review in detail all that is to be seen in this colossal exhibition is beyond the limits of our space, and we can therefore only call attention to some of the salient features. The most striking exhibits are the two that fill the large gallery, the schemes for the improvement of Chicago, U.S.A., exhibited by Mr. D. H. Burnham, and those for Washington, U.S.A., sent by the American Society of Architects. These show the failure in modern estimation of the prevalent type of American city plan, founded on the

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gridiron system, with its rectangular blocks. In the case of both Chicago and Washington it is realised that a city to be a living organism must have a heart, and the main arteries must be connected to it. The centre of administration is the appropriate civic centre for such a city as Chicago. We think the scheme shown by Mr. Burnham is, from an æsthetic point of view, marred by the colossal character of the administration building, although we recognise the difficulty that the existence of sky-scrapers imposes upon the designer who desires his civic centre to be dominant. The scheme for Washington is admirable and a fine example of the grand manner in town planning.

The assistance which the present Exhibition at the Royal Academy has derived from that held earlier in the year at Berlin accounts in part for the considerable space devoted to German examples, but this is also but a just tribute to the care and study that have accompanied the expansion of industrial and commercial activity, with the consequent increase of wealth, during recent years in Germany.

Foremost amongst the German exhibits come the designs submitted and premiated in the competition to obtain a building plan for the improvement of Greater Berlin. The schemes are ambitious, but not therefore incapable of realisation; and, although they would involve a large expenditure, there is no reason to suppose that they are financially unsound, whilst the improvement of the amenities of the city would be undoubted, and, assuming that the citizens are willing and able to pay for these amenities, their cost would be well expended. In town improvements it is right to recognise that a large and thorough scheme will often be found far more justifiable financially than one halting and diffident.

One can readily appreciate from the drawings and models that come from Germany how the eighteenth-century ideal of town planning finds less favour than the mediæval treatment of the "closed vista." Striking examples of this may be seen in the series of plans lent by the Municipality of Cologne, and in the models of the municipal forum of the parish of Weissensee and the Garden City of Hellerau, near Dresden. The general interest of the German contributions is enhanced by numerous photographs of old German towns and their closed vista effects.

From France come plans of Nancy, one of the best examples of Renaissance town planning in the country, of Carcassone and of Paris, lent by the Ministry of Fine Art. M. Hénard sends a number of plans of Paris, especially dealing with suggestions for improvement of traffic facilities. M. Augustin Rey has specialised on astronomical studies, and the question of sunshine and its influence on the healthiness of streets. Mr. J. W. Simpson, the Secretary-General of the Conference, lends some interesting engravings and plans of eighteenth-century Paris, which are of historic value.

Professor Geddes has filled the Black and White Room with a comprehensive collection of drawings and photographs of Edinburgh, which show the Scottish capital as it was and as it is.

British garden cities and suburbs are demonstrated in the Water Colour Room, and we find illustrated developments of Bournville, Letchworth, Port Sunlight, Park Langley, Newcastle-on-Tyne, Wolverhampton, Woodford Bridge, North Ferriby, Earswick, Manchester, Fforestfach, Knebworth, Hampstead, Ealing, Harborne, Stoke-on-Trent, Chester, Cutteslowe, Gidea Park, Isle of Walney, Rochdale, Rosyth, Plymouth, Doncaster, Liverpool, Glasgow.

In this room we particularise as specially worthy of notice the Gold Medal design by Mr. James Crossland, F.R.I.B.A., for laying out a portion of the Corporation Estate at Swansea, which is a notable example of planning on contour lines.

Thus we have examples in the exhibition of the varied principles that have up to now formed the basis of town-planning—the gridiron, the radiating fan, the grand manner with long avenues and places, the closed vista and the contour line.

Of the valuable collection of prints, engravings, and plans of London, and the suggestions by some of our prominent architects for its improvement, space does not permit us to speak fully. We can only advise every one who can, to visit the exhibition, whether they are interested in any degree in town planning or not.

Mr. Leonard Stokes, P.R.I.B.A., in opening the Exhibition of Drawings and Models at the Royal Academy, remarked that he did not quite understand why an exhibition of that sort should require to be formally opened. He was, however, glad that it fell to his lot to do so, in so far as it afforded him a public opportunity of thanking in a two-fold capacity the members of the Royal Academy for lending their galleries. In the first place, he wanted to thank them as President of the Town Planning Conference, for without the loan of the galleries it would have been impossible to hold the exhibition, and without it the Conference would be a tame affair. Then, as President of the Royal Institute of British Architects, he wanted to thank the Royal Academy because they have enabled architecture in its broadest sense to take a step forward—a step which may prove of the greatest use to them in the future. Mr. Stokes said he did not propose to give a description of the exhibition, as the best way of appreciating it was to look round the rooms themselves. The drawings were not produced in the first instance as works of art; their object was to express to the public the ideas of their authors, and to show what they would like to see carried out in bricks and mortar. It was to the very great credit of Mr. Raymond Unwin, hon. secretary, that such a very good catalogue was available so soon. The catalogue might not be absolutely perfect, but as it stood it was of very great use, and a later edition will be published of it. A deep debt of gratitude, said Mr. Stokes, was due to Mr. Raymond Unwin for getting the collection together. The labour had almost entirely fallen on his shoulders, and it was colossal. He was sure that what Mr. Unwin had done would be appreciated. Mr. Stokes, in conclusion, paid a testimony to Mr. Fred A. Eaton, the secretary to the Royal Academy, who had been most kind and helpful to the Conference officials; and in proposing a vote of thanks to the Royal Academy Mr. Stokes coupled with it the name of Mr. Eaton.

Mr. John Belcher, R.A., briefly replied, on behalf of the Royal Academy, to Mr. Stokes' appreciative reference to their granting the use of the galleries for the exhibition. The members of the Royal Academy were, he said, fully alive to the importance of the subject of the Conference, and were glad to be able to do anything towards furthering the good work of preserving the amenity of our towns and cities. Everyone who passed round the rooms and viewed the drawings and plans of the great cities and towns with their picturesque beauties would be interested in town planning, whether they were painters, sculptors, or architects. To painters and sculptors the subject brought opportunities, while the architect will have to bring into one all the forces which go to make a healthy, prosperous and beautiful city.

Tuesday, October 11.

By a curious error of judgment on the part of, we presume, the Executive Committee, evidencing a sad lack of the sense of proportion with which all architects might be supposed to be more or less gifted, the programme of the serious proceedings of the Conference was arranged on the lines of one meeting in the morning and two meetings and three or four visits or excursions in the afternoon. Hence one of two things must happen; either the one event in the morning must be overwhelmed with numbers, or the five or six functions in the afternoon must be sparsely attended. The former condition prevailed, and overflow meetings were arranged, so that the unfortunate readers of papers, or rather lecturers, had to do their work twice over, and as Professor Haverfield said in his opening words to the overflow, "You can't do that properly."

The papers of the first morning meeting were lectures, illustrated by lantern slides; and by order of the Secretary-General the Press are forbidden to publish more than a brief abstract, so that we can only give some of the salient points of each of the admirable papers. The general theme of the first morning's papers was

The Cities of the Past.

At the overflow meeting in the East Gallery the chair was taken by the Lord Provost of Edinburgh. In the Great Gallery the chair was taken by Professor Reginald Blomfield, A.R.A., F.R.I.B.A. In opening the meeting he said that the Conference had been arranged on a certain logical scheme. On Tuesday morning the papers would deal with town planning in the past; on Wednesday they would hear of the cities of the present, and on the two following days of the cities of the future.

The Hellenistic Period.

Professor Percy Gardner, LL.D., F.S.A., first read a paper, which was illustrated by lantern slides, on "The Hellenistic Period." Archæological discovery, he said, had proved to us that the Greeks were more modern than we had supposed. At Knossos remains have been discovered of drains more advanced than any now in use. The Hellenistic Period was an age of extraordinary progress. Architecture and the planning of towns went through the same phases in

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the ancient world as they passed through with us in the modern world. The Hellenistic cities consisted of narrow streets and unimportant houses, the water was carried from wells or streams, the refuse was thrown into the highways. Towards the end of the fifth century the Greeks seriously took up the matter of town planning. The first architect employed was an Ionian named Hippolytus of Miletus. It was to him, to Alexander the Great and his immediate successors that the golden age of town planning was due. It was their policy to re-erect cities on the most important spots of the conquered territory. Within a century there had sprung up, mostly in Asia, a number of cities destined to become wealthy and populous. A few of these have become known to us through excavation. Pergamos, for instance, has been carefully excavated by the German archæologists. The Greek city consisted of four parts. First: In view of the arrangements for defence it was necessary to surround it with a wall and towers; even when it became the custom to build outside the walls these were still maintained. Above the city rose the acropolis. Second: The abodes of the gods in the great city with its precincts. Third: The market place. Fourth: The houses of the inhabitants. Naturally the latter are mentioned last in Greek fashion, though in our time they would come first. Meander had a geometrical scheme of lay-out which is not equalled by any American city. The dimensions of its market-place were noble, being 422 feet by 313 feet. The centre of the city was usually the altar in the middle of the agora. There were at Meander about eighty blocks of dwellings for the inhabitants. In the whole of the city there were some four hundred houses. The Greeks were careful to obtain a good supply of water, which was probably distributed to the important houses. One house at Pompeii has sixteen jets. The Greek adapted himself to the varying local conditions in bringing his supply into the city. In Hellenistic cities the central part of the town area was given up to public buildings. The most striking feature of a well-planned modern town—the open spaces with trees and private gardens—was almost unknown. Such luxuries were prohibited by the limited space within the encircling fortifications.

Town Planning in the Roman World.

The next paper was read by Professor F. J. Haverfield, LL.D., F.S.A., on "Town Planning in the Roman World." One of the rare great periods of town planning was, he said, during the Roman era. About eighty towns were founded by the Romans in the 300 or 400 years of the later republic. The keynote of the Roman Empire was its town life, and under it the creation of towns went on apace. These towns assumed that definite rectangular form which continued until twenty or thirty years ago to be accepted as the pattern. It remained for later civilisation to combine town planning with curling streets. The ground plan of Florence as prepared in 1427 shows the streets arranged in check-board fashion. This particular plan is common to the Roman Colonia.

A further stage shows the Italian architect, probably unconsciously, going back to this plan of his ancestors; when they Haussmannised Florence they returned to the original ideas. Timgad in Africa was a town of one definite foundation which owed its inception to time-expired soldiers. The plan was comprised in an area of 20 or 30 acres. The capitol, unlike in most places, stands on a hill outside the city walls. The structure was modelled on the capitol at Rome. Another feature was the colonnading which lines the streets. The city dates from the time of Trajan. Pola on the Adriatic still clearly represents the Roman foundation. Close by the agora is the temple of Augusta, which, however, is now hemmed in by houses. The ancient laws tell us very little about the control of municipal matters. By one of the clauses in the town charters no house was to be pulled down without the consent of the authority unless the owner was going to erect another house at least as good. A town was rigidly laid out in the beginning, and by that form it had to abide. Belgrade, another of the Roman foundations, shows a most interesting junction of the modern with the ancient. Cologne presents clear vestiges of its Roman origin. The great example in England is Silchester in Oxfordshire. In the centre stood the Roman forum with the basilica on one side. But at Silchester the layout was much less formal, and the houses were of the irregular type that belonged to the country rather than the city. It was, in fact, an accumulation of country houses brought into a town. Professor Haverfield said he was engaged upon excavating a house in Oxfordshire which was in plan quite unlike anything found at Pompeii. Modern town planning seemed to him entirely a matter of gardens. In a town like Silchester each individual had as much garden as they wanted; nor was there need for any open spaces or lungs. There were no industries like those at the present day to be contended against.

Rome.

Dr. Thomas Ashby, Director of the British School at Rome, lectured on "Rome." He described the gradual growth of the city, and said:—

The Palatine hill, the nucleus of the city, was no doubt occupied by the original settlers owing to the natural advantages of its position. It was almost entirely surrounded by abrupt cliffs rising from deep valleys, swampy at the bottom, and frequently flooded by the Tiber, and was only connected at a single point with the tableland on the north by the ridge of the Velia, on which the Arch of Titus now stands, at its north-east corner. The hill, with its two summits, Palatium and Cermalus, is roughly rectangular in shape, and was hence called Roma Quadrata. The cliffs were scarped, and a shelf cut some 40 feet below their summit; upon this a wall of brown tufa blocks, quarried from the hill itself, was built to the height of two Roman feet, and considerable remains of this wall still exist on the west and south sides of the hill. The line of the pomerium, or symbolic boundary of the city, still followed by the Luperci in the time of Tacitus, ran outside the wall at the base of the cliffs.

The first extension of this settlement, towards the east and south, formed the Septimontium, including the two summits of the Palatine, the Velia, the Fagutal, Oppius, and Cispius, and (perhaps) the Caelius.

The inclusion of the temple of Janus within the city boundary must have been a consequence of the fusion of a Sabine settlement on the Quirinal with the original community, and the selection by the united body of the Capitol as their citadel (*arx*) and the seat of the *templum Iovis Optimi Maximi*.

The Viminal (between the Quirinal and the Esquiline) and the Caelian (or the remaining portion of it) no doubt became parts of the city, either simultaneously with, or not long after, the changes just dealt with, and the result was the city of the four regions, Suburana, Esquilina, Collina, and Palatina.

The next stage in the development of the city is marked by the "Servian" wall, which, on the west and east, coincided with the pomerium, while on the north and north-east it included a great portion of the table-land from which the Quirinal, Viminal, and Esquiline originate, and on the south it took in the Aventine, which remained outside the pomerium until the time of Claudius. It thus enclosed what came to be known, at any rate in the time of Cicero, as the seven hills of Rome—the Palatine, Capitoline, Aventine, Caelian, Esquiline, Viminal, and Quirinal.

The outpost on the right bank, at the summit of the Janiculum, may have existed as early as the city of the Septimontium. It was connected with the city by the Pons Sublicius, the antiquity of which is shown by the fact that it was constructed entirely of wood, without the use of metal nails, and that the use of metal was forbidden in subsequent repairs down to historic times. It was, however, the "Servian" city which first came down to the Tiber and began to make full use of it as a water-way. The establishment of the Forum Boarium and the erection of temples and other buildings in it pre-suppose the existence of the Cloaca Maxima and the Cloaca of the valley of the Circus Maximus.

The lines of the streets were, in the main, dictated (1) by the natural features of the site, with its seven hills and their intermediate valleys, and (2) by the position of the gates in the Servian wall, from which issued the roads upon which the supremacy of Rome depended. When the city later on outgrew its boundaries and issued beyond the Servian walls, the main lines of streets were already laid down by these military roads. A new epoch was opened by the censorship of Appius Claudius Caecus (312 B.C.), the constructor of the first military high road and of the first aqueduct. The early years of the second century B.C. were remarkable for a further increase of building activity. The city as a whole seems to have grown up quite unsystematically; it had narrow and ill-built streets, and the central portion, between the hills and the river, was cramped and overcrowded, though it had already overflowed into the Campus Martius.

Julius Cæsar was the first to grapple with the problem. He realised the necessity of improving the communications between the Forum Romanum and the northern portion of

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the city, and the changes which he made in the Forum and the building of the new Forum Julium were directed to this end. These changes were difficult and costly. In a letter written in the summer of 54 B.C., Cicero says:—"Cæsar's friends (I refer to myself and Oppius) have felt no hesitation in spending 600,000*l.* in extending the Forum. The owners of the property would not consider any smaller proposition. We are hoping besides to accomplish another large undertaking. We are building in the Campus Martius a covered voting hall, which will be about a mile in circumference." Pompey, at the same time, erected the first important group of public buildings in the Campus Martius—his theatre and the porticoes connected with it.

Augustus continued on the same lines, completing the plans which Cæsar had begun, erecting a temple in his honour at the south-east end of the Forum, and himself adding another Forum on the north-east of that of Cæsar. To him are due many regulatory measures—the division of the city into fourteen regions, in which the "Servian" wall (now definitely abandoned as a boundary) and the high roads issuing from its gates were in the main used as a basis, eight being predominantly intra-mural and five extra-mural, while the fourteenth lay on the right bank of the Tiber and included the island. In this connection he established the vigiles, who served as police and fire brigade, and were divided into seven cohorts—*i.e.*, one cohort to every two regions. The regions themselves were divided into vici, or quarters. He also carried out a second delimitation of the river banks. Whether it is from his reign that the actual embankment of the Tiber dates we have no means of knowing. Certainly the ancient system, as seen at the Pons Aelius (Ponte S. Angelo), has some advantages over the modern; the walls were arranged in steps, which gave three different widths to the river at different periods of the year, the flood arches coming into use as required. This secured a faster flow in dry weather, and prevented the silting up which now so often occurs, and considerably increased the water supply of Rome. The first public baths, the thermae of Agrippa, were constructed in his time.

The next great epoch of change in Rome is the latter part of the reign of Nero. The degree of his responsibility for the fire of A.D. 64 will never be known. He certainly took advantage of it to appropriate the district between the Palatine and Esquiline for his Golden House (the site of which was ostentatiously devoted to public buildings by his successors), destroying even the temple of Claudius, which Agrippina had erected on a large platform on the north extremity of the Caelian, in order to construct a great fountain there; the temple was, however, restored by Vespasian. But Nero also compelled private proprietors to reconstruct their houses in a more substantial way, and to allow greater width for the streets. He himself constructed public thermæ in the Campus Martius.

Vespasian, the founder of a new dynasty, rebuilt much of what had suffered destruction during the tumults which preceded his accession, and, above all, the Capitol; he also added a new Forum, with a temple of Peace in the centre; he erected the Colosseum on the site of a great lake in the gardens of the Golden House; and, as censor, carried out a new survey of the city. The results of this were probably recorded in an earlier form of the marble plan of Rome, which, in its present shape, dates from the time of Septimius Severus and Caracalla. On the back of some of the slabs on which this plan is cut, portions of a plan, roughly sketched in red, with the buildings partly in elevation, have been found, and this may be attributed to Vespasian.

The short reign of Titus was marked by the completion of the Colosseum and of the thermae which bear his name, and by another great fire, which did considerable damage in the Campus Martius. To the Flavian emperors, but in the main to Domitian, is due the central part of the imperial residence on the Palatine, which had been destroyed by the fire of 64 A.D. Domitian also began the erection of a new Forum, completed by his successor Nerva, the Forum Transitorium, which secured better communication between the Forum Romanum and the eastern portions of the city.

Trajan's most important achievement in Rome was the construction of his immense Forum, which finally solved the problem of easy communication between the centre of Rome and the Campus Martius.

The reign of Hadrian marks another period of activity in building (a very large proportion of the brick-stamps known to us belong to this period), and to him are due three of the most remarkable edifices of Rome—the double temple of Venus and Rome (which occupied the whole summit of the Velia), the Pantheon in its present form, and the great Mausoleum, which he built for himself, with the bridge leading to it. The Antonine emperors confined themselves to the construction of a group of buildings in the Campus Martius (of which the column of Marcus Aurelius was the most prominent feature), and to the erection of the temple of Faustina; but the fire of Commodus in 191 A.D., by which the Forum was especially affected, gave Septimius Severus an opportunity of displaying considerable magnificence in restoration. The marble plan of Rome, on the scale of 1 to 250, which had very possibly been damaged by the fire, was recut, no doubt after a new survey, and it is the fragments of this which have come down to us. It was affixed to the north-east wall of a building which commonly bears the name of Templum Sacrae Urbis, but which was probably a library connected with the Forum Pacis. He also erected a huge palace on the Palatine, with an ornamental façade, the Septizonium, intended to strike the eye of the traveller from the South. Still more remarkable were Caracalla's huge thermae by the Via Appia, massive remains of which still exist. The troublous times between 235 and 284 allowed of little building activity, except for the hasty construction of the *enceinte* of Aurelian and Probus (270-282). These walls seem in the main to have followed the boundary of the regions (and the *octroi* line), though they took great advantage of existing buildings, which were indeed made use of to about one-third of the total length of the *enceinte*. On the right bank the defences merely consisted of two walls ascending from the Tiber to the summit of the Janiculum. The walls are of brickwork, with an internal gallery and towers at frequent intervals. They have, of course, dictated in large measure the subsequent topography of the city. In 283 occurred the great fire of Carinus, which affected the Forum especially, and gave Diocletian an opportunity for executing extensive restorations, notably that of the Curia. But his most important building was the colossal thermae, larger even than those of Caracalla, though far less impressive, their remains having been largely destroyed in modern times. His successor, Maxentius, continued the embellishment of the Forum, beginning in 306 the immense basilica, which was completed by Constantine, and generally bears the latter's name. The round heroön of his son Romulus is remarkable for the skilful use of an awkward site.

With Maxentius's successor, Constantine, begins the period of the official recognition of Christianity; and Constantine himself erected the earliest and most important of the Christian basilicas, some of them on the sites of the tombs of the most celebrated of the martyrs who had died for the faith. This point is one of importance for the mediæval topography of Rome, inasmuch as the roads leading to these churches (which, if erected on the site of a tomb, were situated upon a high road, according to the Roman custom, as is the case with the tomb of St. Paul on the road to Ostia), remained open throughout the Middle Ages. The rest of the upper portions of the city of Rome were deserted after the Barbarian invasions and the destruction of the aqueducts on which they depended for their water supply, and mediæval Rome occupied only the lower portions of the ancient city, the hills being dotted with isolated churches and convents, but otherwise given up to cultivation. Though the Tiber was still the receptacle of the drainage of the city, its water was freely drunk, for even the Aqua Virgo was not restored until the sixteenth century.

The Development of Town Planning During the Renaissance (XVI. to XVII. Century).

Dr. A. E. Brinckmann, of Aix-la-Chapelle, read in German a most interesting lecture on "The Evolution of the Town Planning Ideal since the Renaissance," an abstract of the translation of which we are permitted to publish:—

The early mediæval city was economically and socially a necessity of the urban population, but it had not yet come to be considered in the light of an architectural creation to be treated as a whole. The attention is centred upon the buildings, considered singly, round the square—*i.e.*, the cathedral, the public hall, and the castles of the nobility—but not at all upon the idea of unity. Hence the town as a whole appears merely as an agglomeration of separate buildings and separate small castles. The streets and the squares are merely areas left unbuilt.

It is but gradually that the streets and square acquired a life of their own and that the ground plan became definite. It was little by little that the Piazza della Signoria in Florence was extended and assumed greater regularity, after, about 1300, the Town Hall had been built. The square was never completed architecturally, although Michel Angelo himself, at the request of Cosimo I., who asked him to submit schemes for its completion, advised that the style of

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the Loggia del Orcagna should be extended round the whole square. This would have been entirely in accord with the spirit of the Renaissance, because the aim of the Renaissance was unity in space and consequently unity in the areas within which the various buildings were to be erected. The Renaissance demanded a single external calmness in the form as against the restless aspect and anarchy of the mediæval towns. To develop town planning as an artistic unity, as had been the case before in the Perikles style of town construction, was the object of the Renaissance.

The conception of the Late Renaissance and of the "Barock" idea is different. Rome is the birthplace of the new town planning. The object is to increase as much as possible the architectural effect, and to turn to advantage her special position. The Palazzo Farnese in Rome shows fully the position of this beautiful palace—namely, the width, the street leading perpendicularly to the portico, and a well-proportioned square in front. The eye can command both sides of the palace architecturally completed. We see not only a horizontal picture, but also the palace as a massive form. The front portion of the church of Santa Maria della Pace, in Rome, extends far into its front square, which it dominates and enlivens. The greatest production was the construction of the Peter Square by Bernini in 1656 to 1657.

From the attention of single buildings in the town taken as a whole we come to the transformation of the whole town itself. Closer connections of the parts with one another are sought, and the town is being transformed into an organism alive in itself. In the course of a scheme for the reconstruction of the Vatican Quarter under Nicholas V. (1447 to 1455), who wanted to build three parallel streets to lead to the square of San Pietro, the Baroque principle concentrates the whole force upon one point, upon which he brings the streets together from various directions. The three streets leading to the Piazza del Popolo, which already partly existed in old Rome, are, in their present rectilinear condition, merely corrections of the Baroque style. The *point de vue* is the Obelisk in the square. The object appears to be to construct the streets in such manner that they should lead in both directions to some important building.

The influence of Rome was immense. Without the influence of that city modern town planning would be inconceivable. Such perspectives as are found in Rome have been models, more or less powerful, for other cities.

The development of the conceptions of town planning, whose native place was Rome, was taken up by France, and first of all by Paris, under a monarchy which looked upon town architecture as the highest expression of its power. If the architectural efforts of Rome were like a violent explosion of energy, France, on the other hand, smoothed down the strong contrasts and improved the harmony.

The typical town square originated about 1700 in the Place des Victoires and in the Place Vendôme (formerly Place Louis le Grand) in Paris. It is a kind of union of the central open space of the Renaissance, which became emphasised by the erection of a monument in the middle, and of the Roman "Baroque" front square taking as its *point de vue* the façade of the Capucine Monastery. The façades in the square are uniform and not high relatively to the area of the space. We find a splendid example of proportions in the sizes of the buildings and in the conception of French architects of rhythm in matters of space in the Place Royale at Nancy, which of all the French "places" or squares is the one best example preserved. The movement in favour of rectangular spaces is indicated by the prominence of the contours of the buildings round the square from the triumphal arch towards the Town Hall, which becomes the predominant edifice, whilst it rises at the same time towards the Carrière, and the way leading to it becomes more monumental. The view through this gate towards the square lacks the powerful movement of Rome, and the square itself is not only an imposing frontal square for the Hôtel-de-Ville, but also a space for festive gatherings. The central closed square of the Renaissance is now becoming more animated after having passed through those periods.

The French town architecture, compared to the Roman, conveys the same idea of repose as the isolated square, and, furthermore, it is most economical. The significance of the French garden idea in town planning was immense, and the architects of the time often refer to it as an example worthy of emulation.

In the case of whole towns which were being built now, like Rochefort, Neubreisach, Saarlius, it should be remembered that they were fortified towns. The centre consists of a *place d'Armes*, regular streets easy to survey, run, when possible, radially from the *place* to the *enceinte*. That so simple a structure can be executed artistically is exemplified by the extension of the town of Nancy.

In Germany we can observe in Freudenstadt, in the Black Forest, which was built in 1599 by a German architect with an Italian training, a structure which is exactly the same as the Italian Renaissance construction. The rectangular central square is surrounded by arcades; in one corner stands the Town Hall, with two wings at right angles to each other, and at the other the church, similarly designed. Four main streets extend perpendicularly from the lateral centres of the market, and other streets run parallel with the sides of the market place. The early productions of this period, like Mannheim, Hanan, which were mainly built for the French refugees, follow the regular plan only, without bearing the impress of the lofty conception of the French architects. Nevertheless, sometimes we find artistic productions of this type when they received the patronage of the ruling princes. In this respect we must mention Erlangen. Here we find great beauty obtained by the simplest means. I should like to draw your particular attention to the clever combination of two town quarters of different epochs by the church of the old town and then to the boundaries and consolidation of the streets produced by what is called courts, which impart to the direction of the street a peculiar rhythm. The streets are particularly inclined to take as their *point de vue* the old church-steeples or else the projecting *risalit* of some important edifice.

Next to the more common rectangular plans we find also instances of whole towns centrally agglomerated, as, for example, Neustrelitz, in Mecklenburg, and Karlsruhe.

The great designs were frequently originated by Frenchmen, or at any rate architects with a French training, as in the case of the scheme for building the Berlin Gendarmenmarkt by Bourdet in 1774. A much simpler scheme was carried out later on by building separate houses round the square, but the effect was centred on the expensive edifices of the German and French Cathedral and of the Schinkel Theatre.

By carefully levelling the surrounding buildings one of the most costly square effects was obtained at the Opera House in Berlin. It consists of two squares which merge upon each other, as it were, and complete the end of the Linden Allee and the approaches to the Arsenal and to the Castle. Unfortunately, they are no longer now in their original condition. The effect of these constructions is further enhanced by the colouring of the air and the light, which is not merely accidental, but the designed effect desired by the contemporary architects.

What is sought after in streets is sober uniformity and correctness, width and rectilinearity, and, when possible, harmony between the houses. The Theaterstrasse in Wurzburg, with houses by J. B. Neumann, the great architect of the Barock school, supplies a beautiful example.

After 1800 everything crystallised into a design. The form remained, but the life-giving spirit, with its own energies, was gone. This is the impression produced by the uniformly built houses in Maximilianplatz, Munich, which formerly, however, had arcades open below, almost deserted. Then the sense of relativeness vanishes always more and more. The design of the square of the Munich University at the end of the Ludwigstrasse is not wanting in elegance, but the buildings all round it do not respond to its conception as to space, and are broken up in separate blocks.

Discussion.

Professor Reginald Blomfield, A.R.A., initiated from the chair the brief discussion which followed the reading of the papers. He said that what struck him most about Professor Gardner's paper was the extraordinary modernity of many of the plans shown, as, for instance, in the dimensions of the market-place at Meander. One of the most important questions was the right way in which to bring streets into the cities. He took exception to the remark that the Greek cities of the Hellenistic Period resembled the cities of France before the time of Napoleon. Professor Haverfield had said that the introduction of the straight line in the layout of the square marked the great difference between civilised man and the barbaric. Dr. Ashby had, however, said that the meandering line was preferable. He hoped that Dr. Ashby would put some of his students to study the subject of vistas in Rome; it was a very great one and deserved to be gone into. It was unfortunate that Dr. Brinckmann was not able to trace out the progress of town planning in France.

Professor Rudolfo Lanciani regretted that no allusion had been made to the wonderful skill with which the prehistoric cities had been planned. His own recent investiga-

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tions, especially those in Northern Italy, had raised prehistoric man considerably in his estimation. No modern town can equal the perfect exactness with which they measured out their areas foot by foot. Their towns were divided into squares much more exactly than in any city since. The town of Ostia, which they were now excavating, would prove a lesson in town planning. What has been uncovered up to the present day shows us a city which grew little by little without any fixed plan, and which followed the deposits of the Tiber. But between A.D. 123 and A.D. 130 the whole city was rebuilt by one man, who was absolutely devoted to the principle of right angles. The main street when completely discovered consisted of a straight line 1,500 yards long with a succession of porticoes on either side.

Mr. John Mitchell (Auckland, New Zealand) advocated that in dealing with town planning attention should be paid to the question of site choosing. It was one with which they often came into contact in New Zealand.

Tuesday Afternoon.

The Hon. Mr. Justice Neville presided on Tuesday afternoon at the sitting in the Great Gallery, and apologised for the absence of Professor Geddes, who was to have read a paper on "The Civic Survey."

The Development and Extension of Cities.

M. Augustin Rey, S.A.D.G., gave an address on the development and extension of cities which was profusely illustrated with lantern slides. The lecturer gave many illustrations of the crowded and squalid streets of the great cities of the world, and a number of diagrams showing the mortality, and especially the infant mortality, which ruled in such areas. He laid great emphasis on the necessity of a plentiful supply of air and sun into buildings, and exhibited plans for blocks of houses by which the maximum of light and air could be obtained and the forces of nature thus enlisted to combat disease. He also showed by plans how it was possible for an improved state of things to be brought about at little cost.

(*Continued on page* 251.)

COMPETITIONS.

Belfast.—Sir Aston Webb's report on the competition for proposed enlargement of the Queen's University, Belfast, is as follows:—

Gentlemen,—I have very carefully examined the fifty-seven designs sent in in competition for this work. The majority of the competitors follow very closely the suggestions made to them, as representing the views of the Senate, for the placing of the blocks; but one competitor, the author of the design marked No. 12, has very largely availed himself of the provision in Clause 3 of the conditions, that competitors were "free to suggest any other sites they may consider preferable," and he places one of the new blocks for physics, zoology, &c., on the south side of the existing quad, and the other block on the west side, internally, thus completing the quad and concentrating the buildings.

This arrangement, he points out, permits the library to be extended on the west side, thus leaving the entrance from University Square uninterfered with; and he further suggests a site for the hall, as a pendant to the library on the other side of the main buildings.

The whole scheme is, in my opinion, a very masterly one, and the best submitted in the competition.

The author suggests housing portions of the physics and other departments in the existing buildings. This may or may not be desirable, but, as he also provides the two blocks asked for, this can be decided later in conference with those concerned. The president's house would remain, with certain alterations, and his outlook for the present would be undisturbed.

I further consider that the second best design submitted is that numbered 32, and the third that numbered 48.

I have had the advantage on the question of cost of the advice of Messrs. W. H. Stevens & Sons, surveyors, who have made an independent estimate of the probable cost of these three designs, and who are of opinion that (exclusive of any special foundations) either of them could be executed within the 10 per cent. margin of the sum mentioned in the conditions of 52,000*l.*

I therefore advise that, subject to the conditions laid down in the clauses 12 and 15 in the conditions and instructions to competing architects, the author of the design marked No. 12 be appointed architect to the new buildings, that the author of design marked No. 32 be paid a premium of 150*l.*, and that the author of design No. 48 be paid a premium of 100*l.*—I am, Gentlemen, your obedient servant,

Aston Webb.

The Members of the Senate of Queen's University, Belfast.

19 Queen Anne's Gate, Westminster, London, S.W.:
October 1, 1910.

The authors of the premiated designs are:—

First Premiated Design.—W. H. Lynn, Donegall Square North, Belfast.

Second Premiated Design.—Henry Tanner, F.R.I.B.A., and F. Dare Clapham, F.R.I.B.A., 12 Regent Street, London.

Third Premiated Design.—A. Marshall Mackenzie & Son, 13 Waterloo Place, London.

In accordance with section 27 of the conditions and instructions to competing architects all designs will be publicly exhibited in the Examination Hall of the University for seven days, beginning on Tuesday, October 11.

Denbigh.—The result of the competition for new public hall at Denbigh is as follows:—First premium, Messrs. Porter & Elcock, architects, Colwyn Bay; second premium, Mr. A. Farndale, architect, Kilton Lodge, Brotton S.O., Yorks; third premium, Messrs. Macintosh & Newman, architects, Birkbeck Bank Chambers, High Holborn, London.

Folkestone.—The result of the competition for the new Harvey Grammar School is announced as follows:—(1) Mr. E. Finn, Canterbury; (2) Mr. E. J. Shrewsbury, Maidenhead; (3) Messrs. Halliday & Paterson, Manchester. The assessor was Mr. Wilfrid H. Robinson, architect to the Kent education committee. Sixty designs were sent in, and the drawings are on exhibition in the Town Hall, Folkestone, on Friday and Saturday, the 14th and 15th inst.

ILLUSTRATIONS.

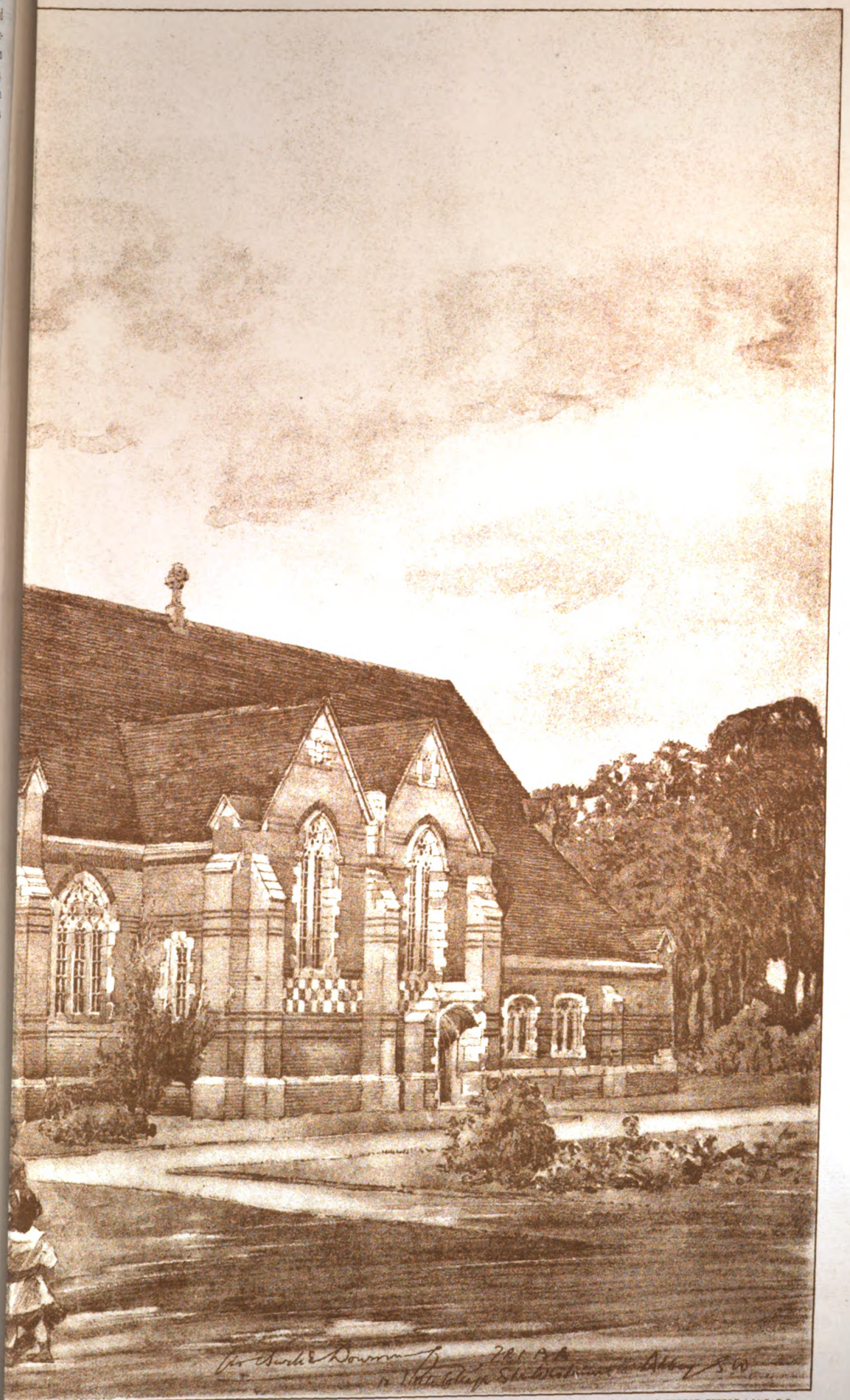
A MISSION CHURCH AND HALL IN SURREY.

We believe that of this group of buildings, designed by Mr. H. P. Burke Downing, F.R.I.B.A., the hall only has at present been erected. Fuller particulars we are unable to give, as our request for same has not been answered, presumably by reason of the absence of Mr. Burke Downing.

ORIENT LINE SS. "OTWAY."—MUSIC ROOM—FIRST-CLASS SMOKE ROOM—THE LOUNGE—FIRST-CLASS SALOON.

The s.s. *Otway* is one of the six new steamers recently built by the Orient Steamship Company for their Australian trade, and is the work of the Fairfield Shipbuilding Company, Glasgow. This firm also executed all the interior fittings to the designs of the architect, Mr. A. N. Prentice. The music-room is panelled in Italian walnut left natural colour and slightly waxed, relieved with enrichments in pear wood. A pleasant feature in the room is the curved recess lined with bookcases. The plain plaster ceiling also has a good effect. The lounge adjoins the music-room and is executed in walnut to match. The quartering of the veneer on the panels gives a rich decorative appearance to this room, which is also beautifully furnished after the manner of an hotel lounge. An electric lift descends from the lounge to dining-saloon two decks below. An attempt has been made in this large saloon to impart a certain amount of Spanish feeling. Lustre tiles have been introduced between the ceiling-beams, and to complete the colour scheme Mr. Anning Bell was entrusted with the large decorative panel at the end of the saloon over the sideboard. The panelling of the smoking-room was carried out in Austrian oak and the floor is of polished teak. The seats, covered in green morocco, are arranged round the saloon for the convenience of smokers and card-players. Outside the smoking-room, facing aft, a shelter-lounge has been arranged for use of passengers in fine weather.

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ORIENT LINE S.S. "OTWAY": MUSIC ROOM.
MR. A. N. PRENTICE, F.R.I.B.A. Architect

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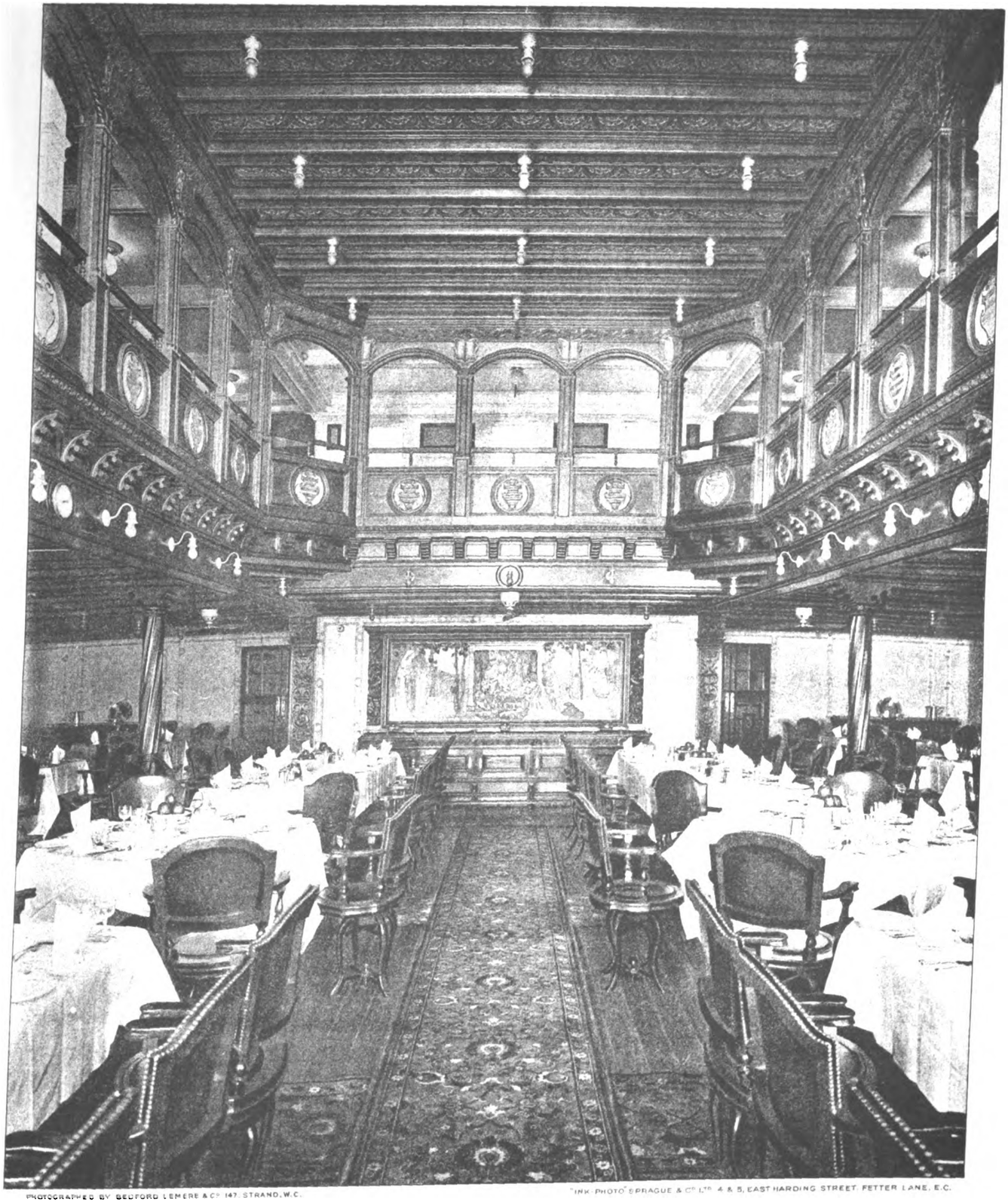
ORIENT LINE S.S. "OTWAY": THE LOUNGE.

MR. A. N. PRENTICE, F.R.I.B.A., Architect.

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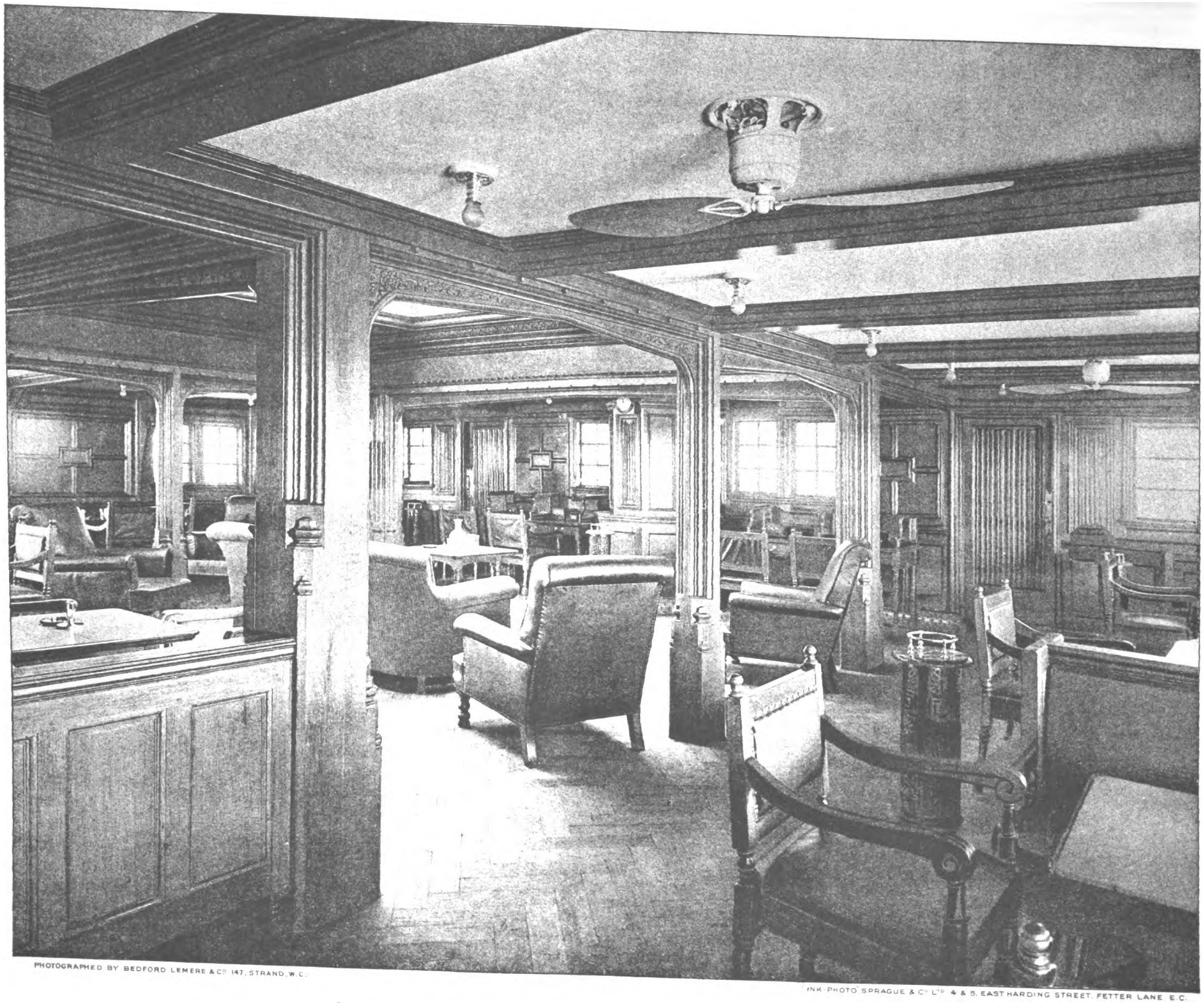
ORIENT LINE S.S. "OTWAY": FIRST-CLASS SALOON.

MR. A. N. PRENTICE, F.R.I.B.A., Architect.

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UNIVERSITY OF MICHIGAN

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ORIENT LINE S.S. "OTWAY": FIRST-CLASS SMOKE ROOM.

Mr A. N. PRENTICE, F.R.I.B.A., Architect

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ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE annual dinner of the Royal Institute of British Architects and banquet of the Town Planning Conference was held on Wednesday evening last in the Hotel Cecil, Mr. Leonard Stokes, president, in the chair.

Among the guests—who numbered 300—were: The Right Hon. John Burns, M.P. (hon. president of the Town Planning Conference), Right Hon. Lord Redesdale, Sir Alma Tadema, O.M., R.A., Sir Aston Webb, C.B., R.A., Lady Webb, Mrs. Leonard Stokes, the Hon. Sir Schomberg McDonnell, K.C.B., Mr. Daniel H. Burnham (chairman of the American Commission of Fine Arts), Sir J. Linton, P.R.I., Sir William Emerson, Sir George Frampton, R.A., Mr. T. E. Collcutt, Sir Robert Morant, Mr. Henry T. Butlin, Sir Edward Busk, Mr. Ernest George, A.R.A., Sir George Gibb, Sir R. Paget, Bart., Mr. J. W. Waterhouse, R.A., the Lord Provost of Edinburgh, Mr. W. H. Lever, Herr Dr. Stätben, Mr. T. Brock, R.A., Mr. John W. Simpson, Mr. Leslie Vigers, Mr. Andrew C. Gow, R.A., Mons. E. Henard, Mr. E. A. Abbey, R.A., Mr. F. Higgs, Mr. George Clausen, R.A., Mr. G. Painter, Mr. Hamo Thornycroft, R.A., Mr. Marcus Stone, R.A., Mr. E. Crofts, R.A., Professor Dr. Rub. Eberstadt, Mr. J. Seymour Lucas, R.A., Mr. T. C. Horsfall, Mr. Leonard Horner, Mr. Francis S. Baker (President of the Royal Architectural Institute of Canada), Mrs. Baker, Mr. Sidney Colvin, Alderman W. Thompson, Mr. and Mrs. Raymond Unwin, Professor A. Beresford Pite, Mr. J. B. Dunn, Mr. G. L. Gomme, Mons. Louis Bonnier, Sir Alexander and Lady Stenning, Sir Henry Tanner, Mr. H. C. Monro, Professor S. H. Capper, Professor G. Baldwin Brown, Mr. F. A. Eaton, Mr. J. B. Wilson, Mr. C. L. Wilson, Mr. H. C. Charlewood, Mr. Percy S. Worthington, Mr. T. H. Fleming, Mr. G. G. Bond, Mr. and Mrs. Arthur Keen, Mr. W. H. May, Mr. Sydney Perks, Mr. James Gibson, Mr. J. A. Gotch, Mr. A. W. S. Cross, Mr. H. T. Hare, Mr. E. L. Lutyens, Lady Emily Lutyens, Mr. Edwin T. Hall, Mr. and Mrs. Lanchester, Mr. M. H. Spielmann, Mr. A. Clyne, Mr. Max Clarke (Mayor of Holborn), Mr. H. H. Statham, Miss Statham, Mr. W. Goscombe John, R.A., Mr. E. Guy Dawber, Mrs. Dawber, Mr. F. R. Farrow, Mr. Herbert Batsford, Mr. H. Nield, M.P., Mr. G. E. Nield, Mr. Banister Fletcher, Mr. R. Weir Schultz, Mr. Ebenezer Howard, Mons. A. Louvet, Mons. H. Lenoble, Mons. J. Bayard, Cav. Ing. Rodolfo R. Bonfijlietti.

The President submitted the loyal toasts which were musically honoured.

The third toast, "The Royal Institute of British Architects and the Town Planning Conference," was proposed by the Right Hon. John Burns, M.P. He said he had only one fault to find with architects, they had too long been on an elevated position, and it was time, he thought, that they got down off their pedestals and mixed with the people, who were in many respects their paymasters. As cities grew and the population urbanised it stood to reason money would be needed for improvement schemes if London and all other towns were to be beautiful. The people thus became paymasters, and the medical officer, surveyor, engineer, and architect would be called upon to meet the requirements of those great communities. He congratulated the architects on having begun so well, but they must now continue the good work by all reasonable means in their power. Artists and architects showed too much reticence so far as the public were concerned; they must put off that false modesty, and, to make the influence of their work spread as it should, come to the aid of the City Alderman and the ratepayer. The architectural profession had given of its best to rectify blunders, civic and otherwise. No one could look at London to-day and, comparing it with the London of his own apprenticeship days, fail to admit that an enormous improvement was coming over the architecture. The Royal Institute and other kindred bodies were to a large extent responsible for that great change and improvement, but they must also respect the claim of the great army of men engaged in the building trade. The apprenticeship system was declining, and it became increasingly necessary that architects in carrying out their great schemes should see that there was no falling-off in the quality of the work, but that it should be equal to the best tradition. Some people asked why trouble should be taken to make London beautiful and attractive. How many people realised that London was vying with Vienna, Paris, and Rome in schemes of improvement? Beauty, he believed, was not only attractive, it was economical and profitable. Other men might say Mr. Burns' plan was a long process. Fifty or even a hundred years was not much in the history of a country, and it had taken Paris 150 years to reverse the hideous obscurity which Voltaire found there. On leaving the Guildhall last Monday the speaker said he could not help feeling how even great architectural minds were not always right. Sir Christopher Wren, when he drew up his great plan for the improvement of London proposed that all churchyards, gardens, and unnecessary vacuities were to be placed outside the town, and yet they found him later arranging that all buildings should have opposite and in front of them a strip of vacant land that should be equal in extent to the length of the façade. Architects should take to heart from the interest that was evidenced in the Conference that they were influencing people in many ways. He had comparatively little to add upon the Conference, but it would be ungracious on his part if he omitted to say that Mr. Stokes deserved their grateful thanks for his work in connection with the Conference and the Exhibition at Burlington House. Mr. Simpson, he declared, deserved the praise of all London for gathering around him such an earnest band of workers who had made the Conference one of the most brilliant functions he (the speaker) had witnessed in the course of his public life.

The President, in his response to the toast, said he would like to repeat what he had said at the Guildhall that it was Mr. Burns who had made the Conference possible and made it a success. Their thanks were due to all the members of the Conference, but in the first place to Mr. Simpson for the enormous amount of trouble he had taken in the matter. To Mr. Unwin, on whose shoulders fell almost the entire burden of arranging the exhibition at Burlington House, and lastly their thanks were due to the Royal Academy for lending their galleries.

Lord Redesdale proposed "Art, Literature, and Science." Sir L. Alma Tadema, Mr. Sidney Colvin, and Professor Dr. Rud Eberstadt responded to the toast.

"The Guests" was proposed by Sir Aston Webb. Mr. D. H. Burnham, Mons. Louis Bonnier, and Mr. Leslie Vigers made brief replies.

THE ARCHITECTURAL ASSOCIATION.

THE opening meeting of the Association for the session 1910-11 was held on Monday evening last in the premises at Tufton Street, Westminster, Mr. Arthur Keen, President, in the chair.

Mr. Edwin Gunn, Hon. Secretary, read the names of eighty-one candidates nominated for membership.

Prize List.

The President then distributed the prizes and medals gained during the last session by the following students:—Mr. V. O. Rees, A.A. travelling studentship, value 25*l.*, and silver medal; A.A. silver medal and prize, value 10*l.*; Andrew Oliver prize, value 5*l.* 5*s.*; advanced class of design prize, value 5*l.* 5*s.*, and bronze medal. Mr. E. Frank Ferry, Saxon Snell scholarship, value 50*l.* Mr. B. F. Matthews, Banister-Fletcher bursary, value 25 guineas, and silver medal. Mr. P. D. Hepworth, Architectural Union Co.'s prize, value 20*l.*; evening school, fourth year, travelling studentship, value 15*l.* Mr. A. B. K. Cook, A.A. essay prize, value 10*l.* 10*s.*, and silver medal. Mr. T. H. Chalkley, elementary class of design prize, value 3*l.* 3*s.*, and bronze medal. Mr. G. Drysdale, Herbert Batsford prize, value 5*l.* 5*s.* (for best measured drawing published in the A.A. sketch-book during the year). Mr. H. T. Barnard, photographic competition prize, value 3*l.* 3*s.* Mr. G. Fildes, history book prize, first year day school; construction book prize, day school. Mr. N. S. Robinson, geometry book prize, first year day school. Mr. M. Day, physics book prize, first year day school. Mr. C. M. Cooper, freehand drawing-book prize, first year day school, and studio prize, first year day school. Mr. D. J. Gordon (bracketed with Mr. C. M. Cooper), studio prize, first year day school. Mr. T. F. Ford and Mr. R. C. Stevenson, bracketed equal for day school second year travelling studentship, value 15*l.* Mr. R. C. Stevenson, Renaissance architecture book prize. Mr. A. E. Maxwell, master's prize, second year day school. Mr. E. Kennedy Smith, first year evening school prize, value 2*l.* 2*s.*, elementary construction lectures book prize, preparatory physics lectures book prize. Mr. J. B. M. Walch, master's book prize for hardest worker, first year evening school. Mr. G. W. Stuart, second year evening school scholarship, free pass to third year, value 15*l.* 15*s.* Mr. E. L. F. Davey, second year evening school book prize, value 2*l.* 2*s.* Mr. H. V. C. Curtis, third year evening school scholarship, free pass to fourth year, value 15*l.* 15*s.* Mr. F. A. Crouch, third year evening school book prize, value 2*l.* 2*s.* Mr. C. W. Rogers, third year evening schoolmaster's book prize for hardest worker. Mr. H. A. Gold, fourth year evening school book prize, value 2*l.* 2*s.* Mr. W. J. Durnford, fourth year evening school, master's book prize for hardest

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worker, and architectural features lectures book prize. Mr. E. L. Apperly, intermediate physics lectures book prize and Grecian and Roman architecture lectures book prize. Mr. F. C. Anson, European mediæval architecture lectures book prize. Mr. A. L. N. Russell, English architecture lectures book prize. Mr. S. J. Edwards, advanced physics lectures book prize. Mr. H. V. Godfrey, materials lectures book prize. Mr. G. A. Fortescue and Mr. G. L. D. Hall, drainage and water supply lectures book prizes, and book prizes given by the lecturer, Mr. R. Stephen Ayling. Mr. H. A. Thomerson, ventilation, lighting, and heating lectures book prize; book prize given by Mr. R. Stephen Ayling; advanced construction lectures book prize; professional practice lectures book prize. Mr. R. A. Walter, water-colour class prize, presented by the instructor, Mr. P. L. Forbes.

The following students have been recommended by the visitors, Messrs. J. J. Burnet and Ernest Newton, for the Board of Architectural Education certificate, which entitle them to exemption from the R.I.B.A. Intermediate Examination:—P. J. Adams, P. M. Andrews, P. D. Hepworth, and H. E. Moss.

Students awarded the Association two years' course certificate:—F. C. Anson, E. L. Apperly, T. F. Ford, J. L. Howe, J. E. M. Macgregor, J. E. D. Manlove, A. E. Maxwell, A. B. L. Roberts, M. Robertson, C. Rowntree, R. C. Stevenson, L. Shuffrey, F. P. Spooner, B. H. B. Symons-Jeune, T. F. H. White, H. M. Whitehead, and L. M. Yetts.

The President delivered his address.

The President's Address.

It is scarcely necessary for me to preface my address by saying how deeply sensible I am of the honour of being asked to preside over the work of this Association—an Association doing such valuable work on behalf of the art that we all seek to serve. The position of President has been held by men of such distinction that it is a great privilege to be placed in the same line with them, and I confess to a good deal of diffidence and hesitation. I am only a comparatively recently elected member, not even claiming as a recommendation that intimate knowledge of the Association's affairs coming to one who has been through its courses as a student; but I yield to no one in my belief in the value and influence of its work in the past and present or in the possibilities that are before it in the future; and, as far as my time and ability extend, I am prepared to do all that I can to serve the best interests of its members.

I congratulate the Association on having men on its Council possessing qualifications of a very high order. The architects of some of the most important building undertakings now being carried out are members of it; but while we give the new members a cordial welcome, we regret losing the benefit of the experience of old members of the Council, such as Mr. Walter Cave, who was president for two sessions; Mr. Maurice Webb, a very capable hon. secretary; Mr. Baxter Greig, who was an able editor of our Journal; Mr. R. Frank Atkinson; Mr. G. G. Scott, the architect of Liverpool Cathedral; and Mr. Henry T. Hare, who was a past-president, and whose services as hon. treasurer for four years we valued very highly.

We are glad to have Mr. Curtis Green back with us, and we are glad also to welcome Mr. Cecil Brewer as a new member of the Council, and I congratulate him on his success in connection with the great museum to be built at Cardiff. Mr. Tapper, whose knowledge and experience of ecclesiastical architecture should be of great service to our Association, is another very welcome new member of the Council.

We are sorry to have to record the death of some of our members during the past year, but with a membership of about 1,600 it is almost inevitable that we should lose some in this way each year. Mr. George Sherrin and Mr. Thomas W. Cutler had both of them been members for about forty years, and their death is a great loss both to this Association and to their profession. Mr. W. R. Mallett, again, was a member of some forty-three years' standing. Another loss that we regret very much is that of Mr. L. G. Detmar, who won our Travelling Studentship in 1902. He was one of the younger members, but a man of quite unusual capacity and promise.

This Association exists for the benefit of the student, and it is to the younger men more particularly that I propose to speak this evening. As regards the prize-winners, I compliment them warmly and sincerely on the character of their work. There is nothing meretricious about it; it is sound and good, and shows good promise for the future; but I beg the unsuccessful competitors to remember that, at any rate, no good comes of being discouraged. The reward lies in the doing. The real successes of life come only after a great deal of struggling and a good many failures. I may remind them how Brunelleschi failed to win the great competition for the gates of the Baptistery at Florence, the thing of all others that he had set his heart on; but he lived to set the crowning glory on the city when he reared the great dome of the cathedral, which is to this day one of the wonders of Europe.

The exhibitions held here are a good indication of the value of the work that is being done, but all that they can show is a trifle in comparison with the progress that is found when one looks at the matter over a space of a number of years. At the exhibition of the Arts and Crafts Society in the early part of this year I was very forcibly struck with the progress made in decorative art since the early exhibitions of that Society. It was like the difference between amateur work and professional, and a friend whom I met, a member of the Committee of Selection, told me that he was astonished at the great quantity of good work sent up by men whose names even he did not know. The fact is simply that the various schools of art and design have become well organised, the decorative artist has been taught craftsmanship as well as academic design, and a degree of skill formerly quite the exception has been developed in the average designer. The same thing is true of painting and of executive music and many other arts, and I am quite sure that you students, if you follow up loyally the opportunities you get here, will during the next generation raise the standard of work far beyond the highest point reached in the past twenty-five years. Whether or not you will succeed in making your art of architecture a vital, convincing thing, with such force and movement in it as are shown, for instance, in science, will depend on what use you make of your opportunities. The views of science are never crystallised: they deal with facts, and therefore advance is inevitable whenever sufficient basis for it is offered, however distasteful it may be to those whose opinions may have to change; but art being a matter of personal feeling and expression, and free from compulsion, is therefore conservative. For architectural design to be real and living it must be so intimately related to construction and to practical requirements as to be inseparable; and this can only become possible if the architect is an intelligent, imaginative artist, able to turn his back if necessary on all preconceived ideas, but at the same time utterly unable to do anything that is not instinct with beauty.

It may be, as Professor Lethaby has suggested, that great developments might follow from dealing with the problems of the architect from the scientific standpoint, and I can well believe that it might be so if the average architectural undertaking were of a monumental character or of such magnitude as the Albert Hall; but one can only feel that the scientific basis can hardly apply in general architectural design. But Professor Lethaby made use of one notable expression in his recent paper, which was that "true originality is to be found by those who, standing on the limits of the sphere of the known, reach out to some apprehension and understanding of what is beyond; it is the next step in orderly development." That is to say, we must have full knowledge of the art of the past before we can produce original conceptions of any value. He himself has given us ample illustration of this in his own work, for it is full of originality and charm, but it proceeds from study of such close and accurate character as very few people are capable of. The terrible vagaries of the "New Art," if art it can be called, afford sufficient indication that it is past the power of man to originate anything beautiful; he can only proceed from what is known and from what is around him, with the beauty of Nature as his chief inspiration.

John Ruskin did not hesitate to put the whole matter in the few forcible words, "All noble art is the expression of man's delight in the beauty of God's handiwork." Perhaps he applied this principle to architecture in too narrow a way, not realising sufficiently that the essential basis of architectural design is contrivance to meet certain purposes and constructive requirements, and that a building is in the first place and of necessity constructional, organic and utilitarian, a great part of its interest depending on the way in which these necessities are met; but at the same time there are abundant cases where he took a more liberal view, as, for instance, in the "Seven Lamps," where he says: "The value of architecture depends on two distinct characters: the one, the impression it receives from human power; the other, the image it bears of the natural creation"; although even then he was speaking rather of the handling of material in ornament and detail than in structure. I regret exceedingly the contemptuous tone in which John Ruskin's views are spoken of to-day, often by those who have not one-tenth part of the

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right that he had to speak with authority. They have their limitations, but at any rate they take the highest standard of criticism that has ever been taken; and I doubt whether any exception can be taken to them on the positive side. He never gave his admiration to anything unworthy of it, and if he refused it to much that we now find pleasure in, it was only because his hatred of the later phases of the Renaissance in Italy led him into prejudices that were often unreasonable.

I think it may be claimed, in spite of Ruskin himself, that the great qualities of architectural art which he compared to seven lamps are those which distinguish all noble architecture, Classic as well as Gothic. They find some expression in the great buildings of all times and places, from the solemn temples of the Egyptians to the latest Roman Catholic cathedral.

The means and methods of expression have varied in every age. At one time the Churchman and the mason have worked side by side in contrivance, arrangement, and construction; at another the eager artist of the Renaissance has left the paint-brush or chisel and built great frowning walls of rusticated masonry, has played with light and shadow in sunlit columns and great overhanging eaves or cornices, or has enjoyed the excitement of daring feats of construction; or, again, the religious earnestness of the Gothic revivalist has striven to win back the secrets of the ancient masters and to do something worthy of the faith, ideals and traditions of an ancient Church. There is no lack even to-day of ideals or of teachers, from those who want us to "think Imperially" in matters of design, to those who would make all beauty grow out of the character of material and the capacity of the craftsman. All have their place—all are right and all are wrong: some think we should go back to absolute simplicity, and thereby be sure not to offend good taste. Others hold that, while renouncing architecture, so called, in favour of mere sound building, we must offer our clients the gratification that comes from harmonious blending of colours, ingenious arrangements of materials, tool-marks instead of mouldings in stone and wood, and the texture of handiwork instead of the smug perfection of the machine. Others, again, go to another extreme, and say we are to train our students in the art of arranging noble masses of building in dignified piles with all the wealth of elaboration that columns and entablatures, dome, vault, and lantern, stately terrace and wide-reaching colonnades can give them. Each method is right in its way, and simplicity is as delightful in a Devonshire rectory as the art of the craftsman in a village church, or the grandeur of dignified elaboration in a national building; but the main test of all design is fitness, and it is not by designing palaces that one will learn to build a village school; not by working in a plasterer's shop that we can gain such skill as Soane displayed in the wonderful interiors he contrived, or that Bodley used in building his great church at Pendlebury. I do not undervalue the training in handicraft at all; it is most valuable; it helps a man to an appreciation of what we may call "values" in material and workmanship. It adds to his pleasure and interest in his work, and makes him understand the respect that is due to the workman. But it must only be accessory to his studies in the things that concern the architect as distinguished from the builder and the craftsman. The architecture of cities has to be learnt as architectural design, and not as craftsmanship; and there is no better way of learning it than by the orderly methods of a well-organised school such as ours.

You young men are enjoying advantages not at present realised. You are being taught things, as part of your regular equipment, that your seniors have often had to learn with great difficulty and at very short notice when called upon to put them into use. I urge you to make yourselves masters of all that can be taught in the schools about the material of design: all about windows, piers, columns, tracery, parapets, vaults and arches and pediments; about the placing of sculpture, the uses of ornament and its scale and forms. How the Romans built their vaults and arches and the thirteenth-century masons theirs, and what the value of each kind was when done. Learn how spires are placed on towers, and how each method affects the outline, and wherein the outline of a good steeple varies from a bad one, and how the difference has been achieved. Learn how heraldry should be used, and what relation it should bear to other decorative work. Learn why foliage should be formal and conventional in some places and free and natural in others. Study until you know it as a matter of instinct where animal forms or figure sculpture may be full size or more, and when they should be small Learn how far the disposition of a mediæval cathedral is due to its uses and how far to its structure, and how each may need to be modified in the present day to meet altered conditions without violating principles of design or construction.

(*To be continued.*)

THE TOWN PLANNING CONFERENCE.

(*Continued from page* 248.)

Some Factors in Town Planning.

In the absence, through illness, of Sir Wm. Richmond, his paper on the above subject was read by Mr. H. D. Searles-Wood. The author said that the town-planning scheme would appear to indicate a general opening out for the employment of many and various factors immediately connected with the arts of architecture, sculpture and painting. But besides these, many branches of what are called the minor arts will necessarily in time come under consideration. Metal work (chiefly wrought iron), wood-carving, fencing, stucco work, and, as it seems to him, essentially also the laying out of formal gardens, arbor culture as well as floral. Indeed, the idea which has prompted the initiation of this important movement seems to be fraught with possibilities endless as regards their practical and æsthetic value. They all knew that structure grows, or should grow, out of the plan. The plan, therefore, is the dominant note of each chord in process of development. Symmetry of plan may be *ad nauseam*. Unsymmetric arrangement employed with obvious self-consciousness may degenerate into affectation and mannerism. Effect is promoted by balance of symmetry and unsymmetric treatment. Many geometrical forms, other than the circle, oblong, or square, may be used with advantage. The oval, ellipse, together with triangles of various qualities of proportion, discreetly used and varied in their application, will redeem a plan from obvious monotony, and produce unexpected effects of light and shade upon elevations. Thus a pleasant variety might be attained, difficult spaces dealt with, and undue formality avoided. In our climate well-lighted colonnades, glass-covered areas—not necessarily narrow or restricted—would be most acceptable for winter plaisance and summer shade whenever the latter may be essential in our fitful and rare summers. In projected gardens places should be arranged for fountains, also for bandstands. Not far off from the gardens covered spaces might be considered indispensable as forming retreats in bad weather. Of course, places of public entertainment, gymnasiums, schools, and churches will have to be considered. All electric-lighting stations should be provided with complete smoke-consuming apparatus.

With a view to render the air as pure and immune from smoke as possible, all grates should consume as much of the smoke of private fires as possible, and every encouragement should be given to the manufacturers of smokeless coal. Indeed, it might be a part of the town-planning enterprise to devise, especially for the dwelling-houses of the poorer classes, central heating stations from which necessary warmth might radiate. Also the erection of cooking stations and cheap restaurants for the poorer classes, encouragement being given to them to club together, a system which would promote economy, healthy food, and good fellowship, so much needed among our poorer brethren. If they cured the smoke evil, gardens on house-tops might be possible even in our climate. It is the dirt produced by London smoke which makes these impossible at present. He could not but think that the architect—who is, or will be, of course, the prime director of all town planning—should consult the sculptor and painter. Mural painting is pretty nearly certain to come into more general use when the smoke of our towns is abated. Sculpture, happily, is already inaugurated as in a measure an essential whenever a building is to be representative or illustrative of any noble purpose; yet not nearly enough is this the case, partly because the sculptor is not taken into the confidence of the architect *ab initio*. Wherever there is to be sculpture, the sculptor should be in consultation with the architect from the starting of any plan. The same law should apply when coloured decoration is in view. The painter should be in consultation with the architect from the earliest moment of plan-designing. None but accredited architects who had passed proper examinations which have fitted them to be designers and constructors, or constructors and designers, should be enlisted in the ranks of responsible guides for the town-planning scheme. Care will also have to be taken in London to provide against the interference in matters of art and taste of the Office of Works.

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To relieve them from that body—if it be possible to do so—when the town-planning committees are established and strong-going, they should be represented by their own member of Parliament, whose duty it should be to instruct "the House" and the Office of Works in matters which touch either on convenience or æsthetic laws. The former may be superficially understood; the latter are almost as little comprehended as they are cared for.

He ventured to hold the opinion that the scheme under consideration is a gigantic and splendid one, and as such is full of pitfalls which will have to be bridged over or destroyed before the plan is erected and becomes a strong, powerful, commanding edifice. Its success depends on two things, the first being that none but responsible architects, engineers and builders shall have anything to do with a final judgment; second, that upon the governing committee the presence of some of the leading sculptors and painters of the day should be obligatory. If the plan goes on, if it be exempted from the middleman as much as possible, if the ruling powers of the committee elect as far as possible to employ young men who have received diplomas from various—to be specified—authorities, it appeared to him that the town-planning scheme will give intelligent labour to a class of students trained by the State, who, under the supervision of older and more experienced men, would be encouraged to work out their own ideas. If this can only be brought about, success may be confidently looked for.

Discussion.

Mr. C. T. Horsfall said that Sir Wm. Richmond had reminded them of the pitfalls, but he thought the importance of the points brought forward by M. Rey were of greater importance. He was afraid their authorities would get bewildered by the amount of advice which was being given them in this Conference and at other places. There were the admirable proposals of Professor Geddes, for instance, in which he told them they must make a complete survey of the history of their towns before doing anything. He did not think that their local authorities were so eager to go on that they wanted holding back. M. Rey had put forward considerations they ought to try and impress on their town councillors that the first conditions which were needed for the beauty of a town were also the conditions which were needed for health. When their town councils made bye-laws which would prevent any working-class dwellings being built without a playground being within easy reach and without some open spaces containing some of the beauties of Nature, then he would be content. He did not say that was all they required; but when they considered that 80 per cent. of their people lived in cities and in not one of them were all the conditions necessary to health, then he did say they ought first to concentrate their attention to get town planning which would bring conditions essential to health within the reach of all members of the community. He hoped they could trust their architects to insist upon the other necessaries for the welfare of the community, because they did require a very large amount of beauty in their towns to keep them in health and to keep their brains sane.

Councillor Walsh (Dundee) said he was much struck with the diagrams of M. Rey showing the frightful mortality amongst infants relative to cubic air space, and this was a feature which went to the root of the matter. They knew, however, that unfortunately the question of expense came up in every town, and it was not every person who would sacrifice either his private means or the town's rates even when it was an absolute clear case of saving life. They had a large number of persons in their town councils who were not able to take broad views and who could only estimate the profit and loss of to-day and could not look to the profit and loss in the future. Unless they could find some way of getting round these men the feeble pressure of Mr. Burns's Bill was not going to do much good. That morning he listened to the professional dignitaries from Oxford telling about beautiful things; but were Oxford and Cambridge and Edinburgh and Aberdeen Universities going to stop there? Could not they get their scholars and their sculptors to come upon their town councils? Why was there such a divorce between scholars and the practical work of their municipalities? With the exception of a few legal men and a clergyman here and there the professions of the country stood aloof from municipal administration; but this Town Planning Act was an opportunity which should appeal to the higher elements of their civilisation, and if the professional people in general did not take hold of the opportunity, then the ordinary members of their City Councils would not do the work.

Mr. F. R. Durham considered that the engineering body ought to have been more strongly represented at that Conference, because without the engineer the architect could not produce a town plan, whilst equally the engineer could not produce one without the co-operation of the architect. It was greatly to be regretted that the Institution of Civil Engineers had not co-operated with the R.I.B.A. in the Conference. He hoped influence would be brought to bear on the big engineering institutes to join hands and co-operate in the great work which the Institute had undertaken.

Mr. P. Macnaughton (Edinburgh) said he represented George Heriot's Trust, which had to a great extent been responsible for the planning of Edinburgh north of Prince's Street, and they would appreciate what a great planning that was. The great difficulty of town planning was expense. They could not get on without the speculative builder, and he would not build unless he could see a profit. They all knew that the ideal thing was to get as much light and air for the inhabitants of a great city as possible, and the first thing to bring that about was to get land cheaply, which seemed a difficulty almost insurmountable.

Sir Richard Paget said that so far as one could judge from the architecture one saw about, the assumption of architects was firstly that there was no rain, secondly that the wind never blew, and thirdly that the sun never shone, or at any rate that there was a steady diffused light in all directions. In planning their streets they never seemed to take into account that three days out of four it did rain in this country. As a practical point he asked whether it would be practical to do away with a certain number of carved ornamentations which appeared on their modern architecture and spend that money in covering over the pavement so that they could walk about and shop in comfort. He asked whether it would not pay as a commercial venture for a town to be known as the most comfortable town in the world to get about in.

Mr. Morgan (Manchester) remarked that few of M. Rey's plans would pass the local by-laws of this country. At the present time our by-laws were arranged to save officials and administrators a great deal of trouble.

Mr. H. C. Ibberson said it was suggested that professional men should go on Town Councils, but the difficulty was to get there. He knew of a man who was defeated because he had bought some things from London instead of in the local town. It had also been suggested that architects should show how the money was to be obtained for these great schemes, but that was not the function of the architect. It was the business of the general public to get the money, and then the architect would provide a scheme. That it could be got, however, was shown in the case of the Hampstead Garden City.

Dr. S. Lawrence (Edmonton) remarked that the previous day he had felt a keen sense of disappointment that Mr. Burns did not explain the Town Planning Regulations. When these regulations were explained, two things would be necessary—viz., common sense in their local bye-laws, and the right kind of men on the town-planning committees.

The Chairman said the point of view to which town planning appealed to him was that of the housing of the working classes. He had been greatly interested in the Letchworth scheme, because he felt that they had to check the abnormal growth of towns, and that could only be done by carrying out plans such as at Letchworth. Unless they were going to house their working classes on a commercial basis they were going to enter on a *cul de sac*, from which there would be no exit except the housing by the State of the entire population, which was outside practical politics at present. So far as municipalities and private bodies provided accommodation under cost it meant driving out of the trade the best persons, and leaving those who, because they had scamped their work or made profit in irregular ways, could get a return on their capital.

In the East Gallery, Mr. Leslie Vigers, President of the Surveyors' Institution, was in the chair. Two papers were read, one by Mr. H. Chaloner Dowdall, M.A., B.C.L., on "The Growth of Legal Control over Town Development in England," and the other on "Town Planning and Land Tenure," by Mr. C. H. B. Quennell, F.R.I.B.A.

The Growth of Legal Control over Town Development in England.

Mr. H. Chaloner Dowdall, of the Northern Circuit, Barrister-at-Law, described the three ways in which the State may control action within its territory as:—

First, the State may establish conditions of general application and rely on the action of individuals acting

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within those conditions to produce results beneficial to the State. This may be called the common-law method, and governed all land development in England until the middle of the eighteenth century. Secondly, the State may confer on local authorities power to lay down conditions of local application, or power to acquire and control property within their locality. This may be called the local government method, and was introduced in the eighteenth century to remedy the shortcomings of the common law system. Thirdly, the State may itself lay down conditions of local application, or may itself acquire and control property. This may be called the method of direct State control, and dates from the first Public Health Act of 1848.

Each of these methods, either singly or in combination, operates in the sphere of land development in which town planning occupies an increasingly important position.

Leaving on one side all that concerns the construction and repair of roads, sewers, and buildings from the sanitary point of view, and touching only on that which concerns the planning and replanning of towns, one may say that, apart from the Town Planning Act and apart from Special Local Acts, the powers of a Borough or Urban District Council are shortly as follows:—(1) The Council may, with the approval of the Local Government Board, make bye-laws regulating the level, width, and construction of new streets, and, with reference to the sufficiency of the space about buildings, to secure a free circulation of air. (2) The Council may buy land in order to widen, open, or enlarge streets, or, with the sanction of the Local Board, in order to make new streets; provided that where compulsory powers of purchase are sought they must be obtained by Provisional Order and are subject to the Lands Clauses Act. (3) The Council may prescribe a line beyond which no new or reconstructed building may be erected or re-erected, compensation being paid to the landowner for the loss he sustains. (4) The Council may to some extent control the frontage of buildings. (5) The Council may vary the intended position, direction, termination, or level of any projected new street in order to secure direct, easy, and convenient communication.

For the century previous to 1848 control had been exercised by private Acts of Parliament, and since that date chiefly by local governing bodies, subject, however, in many instances, to the approval of the Local Government Board, and subject also to the sanction of Parliament when compulsory powers of purchase are required.

The Town Planning Act relates to land in course of development or likely to be used for building, and in certain cases to land adjacent thereto, whether already built upon or vacant, and it introduces an ingenious method of procedure; the effect of a "scheme" approved under the Act is that of a private Act of Parliament, the "procedure regulations" taking the place of standing orders in Private Bill or Provisional Order procedure; the central criticism and control, instead of being exercised by a committee of either House or by Parliament itself, will be exercised by an expert department of the Local Government Board, Parliament only reserving to itself a right of veto in certain circumstances. The local authority also appears, either spontaneously or possibly under compulsion, as promoter of the scheme and as responsible for its execution. As to the matters which may be included the Act contains no limitations, though presumably they will relate to those set out in general terms in the fourth schedule of the Act. The "general provisions" will presumably take the place of common form clauses in private Acts. The Act, in short, gives to the Local Government Board a perfectly general power to make local Acts of Parliament, called "schemes," with reference to streets, roads, and other ways, including stopping-up or diversion of highways; buildings, structures, and erections; sewerage; lighting; water supply; ancillary works; extinction and variation of private easements; and all incidental powers. The only limitations on this legislative power vested in the Local Board are, first, that if anyone interested gives notice of objection to any scheme, or if the scheme suspends any enactment of a public general statute, then either House of Parliament may within a limited time exercise a veto; and, secondly, any person injuriously affected must be compensated, such compensation, however, being assessed by a Local Government Board arbitrator. This power of interference with private rights by a Government Department is in England and within modern times quite unprecedented in magnitude.

An account of the Town Planning Act would be incomplete without some reference to the Development Act of the same year. Public control may be exercised also by the Central Government either passing special Acts of local application or itself executing or controlling works. The Development Act illustrates this last method.

The road-improvement clauses establish under the Treasury a Road Board, with power to construct and maintain new roads or to subsidise the construction or improvement of roads, principally in rural districts, to which the powers of Urban District and Borough Councils do not apply. Hitherto no power was given to acquire land compulsorily in order to construct new roads. The Development Act gives the Road Board power to do this, and also to acquire land some 220 yards on either side of the new roads, the arbitrator for compensation in such cases being appointed by the Lord Chief Justice and the general control kept in the hands of the Treasury.

The cost incurred by local authorities in carrying out a scheme under the Town Planning Act was grouped under three heads:—(1) Cost of preparing and promoting a scheme which would appear to be not necessarily very heavy; (2) cost of compensation to owner for injurious affection, which is somewhat indefinite; and (3) cost of land purchased by the local authority for the purpose of a scheme in cases where purchase would seem preferable to the payment of compensation.

Town Planning and Land Tenure.

The second paper was by Mr. C. H. B. Quennell, F.R.I.B.A., and was on the above subject.

The Town Planning Act, he said, offers two ways by which town-planning schemes can be carried through. The one where local authorities buy land and develop it themselves; the other where, after consultation with landowners and other interested parties, a town plan is prepared which is left to private enterprise to be carried out. Of the two alternatives it is safe to assume that the latter will be the one generally adopted, as being more in sympathy with English traditions. Suburban development, then, will proceed on much the same lines as before, excepting only that each detail will form part of an ordered scheme, bearing its proper relation to the whole. But the provision of the necessary capital and the details of land tenure remain unchanged under the Act.

As it is just these same very utilitarian details that have shipwrecked many a good scheme in the past, Mr. Quennell said he would recapitulate them for the benefit of those who may not be familiar with them.

The steps he described in a development scheme were thus summarised:—

(1) The landowner's first responsibility as to the laying-out of the estate, and the amenities thereof; (2) the building agreement, by which the builders who follow take up the land; (3) the provision of capital for builders; (4) the details of land tenure and the methods by which the purchasers will buy the houses and hold the land; (5) the provision of capital for purchasers.

Mr. Quennell also summarised the details by which the Town Planning Act can be assisted in its working here in England as—

1. By the landowner awakening to his responsibilities and helping the Act forward by being prepared to fall in with the details of the town plan.

2. Simplification of land transfer by the abolition of the private deed system in favour of land registration, which has already had its trial and has worked well.

3. The reduction of costs which may be expected from the foregoing, and the more general sense of security that will be consequently engendered.

There is another side of the Act, the one that will interest the architect members of the Conference, and that is the admission by the measure that amenity—or shall we say beauty?—is once more to be recognised as a quality, an elusive charm to be sedulously guarded where we have it, and sought after where it is non-existent. Amenity may be construed as the quality of being pleasant; and that an Act of Parliament should recognise such a state of things as being desirable is a confession that mere utility henceforth is not to be acclaimed as the sole virtue. To architects an opportunity is offered to so wed utility and beauty that they may dignify themselves as artists.

That the Act, then, can fail is unthinkable; it has that gleam of imagination in it which, coupled with its author's profound knowledge of English local government, should be sufficient to move on one side the mountains of prejudice and interest that have hitherto stayed the development of our towns.

Discussion.

Mr. Isaac Edwards, estate agent, Merthyr Tydfil, said that what appealed to him in Mr. Quennell's paper was the way in which it touched upon the practical problems which

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faced anyone interested in housing the working classes to their advantage. There were undoubtedly many difficulties to be overcome. In his own district freehold was hardly known. A case occurred recently of a sale of property under the order of the Master in Chancery. When, however, the title was sent up to the Government department, the officials sent it back saying they required more particulars. This involved, of course, a good deal of extra cost. The incident suggested what was done to hamper the actions of people trying to house the people. In conclusion, he urged that local authorities should be impressed with the necessity that people should build or buy houses for themselves.

Mr. Edwin T. Hall, F.R.I.B.A., described the two papers as exceedingly interesting and as historical in so far as they brought us up to the position in which we are to-day. Mr. Dowdall's paper showed what the rights of the authorities now are. But it was to be remembered that what is popularly called the Town Planning Bill was rather an Extension Bill which deals with the laying out of land ripe for building and for the extension of that which exists at present. He would not pretend to discuss the legal aspects of the question, but he would say that if anyone thought they were able to do without lawyers they were greatly mistaken. There were many problems connected with compensation under the Act. For instance, supposing in the development of a district it was necessary to take the whole of a man's property—say, a cottage belonging to a workman—there would seem to be no compensation for him. But surely, said Mr. Hall, he ought to be properly compensated! With regard to Mr. Quennell's paper it seemed as if the leasehold system was the only convenient one for the small man. Instead of getting fee simple for ever and ever, he gets it for a stated period. A client of his had purchased a freehold property, but found it to his pecuniary advantage to convert it into leasehold. This shows that leasehold is not such an iniquity as some people say. Further, it is the only system by which one owner is protected from an adjacent owner doing him an injury, for by taking a lease a man is prevented from harming his neighbour. In developing an estate it always led to an increase in value. On the other hand, in localities like Sydenham Hill, rent value under the altered conditions, since the houses were erected, has gone down 50 per cent. That, however, had nothing to do with the leasehold system, for it is solely due to the fact that fashions have changed and men want to get out further from London. The principle upon which garden cities are growing is the promotion of a community of interests so that everyone would be an owner in common with everyone else, thereby being drawn closer together. It was absurd to cavil at such "enlightened self-interest" as was manifested in the 18th century when great property owners in London gave up some of their land for formation of open spaces. Such self-interest was a perfectly legitimate thing and has made Englishmen move the world. There are unfortunately large numbers of landowners who simply buy a piece of land in order to make as much out of it as they can, just as they would purchase nuts or sugar. They permitted houses to be crowded together in a disgraceful manner and generally brought discredit on land owning. But the bigger owners impose conditions on their land for the prevention of houses being erected so close together as to create slum property. The Housing and Town Planning Act, said Mr. Hall in conclusion, was a very valuable one indeed; he looked with great hope towards a future where people will be living in greater comfort and there will be rising up a healthier, a nobler, and a thoroughly loyal race.

Mr. John Lindsay, Glasgow, complained that interesting though the papers were, they did not touch upon the question which was all-important to corporations, viz., the benefits to be derived from carrying into operation the clauses of the Act. His own purpose as an official was to ascertain what practical good was to arise from the statute. After careful consideration and enquiry he had come to the conclusion that everyone was in a state of uncertainty on the point. It seemed to him that the purpose of the Conference should be to clear up that doubt. The Act had been heralded with great shouting as though it were going to create a new heaven and a new earth. But everything seemed to deal with generalities. It really appeared as if the difficulties were going to be just as great and the cost very little less than before. In Scotland they had already been possessed of powers for carrying out improvement schemes. Now for the first time they were required to obtain the consent of the Local Government Board. The difficulties were increased by the provision that one local authority can endeavour to carry out a scheme on territory which encroaches on or even lies within the territory of another local authority.

Mr. Cowley, of Northwick, wished that the Local Board had attempted to simplify the procedure to be gone through. With regard to the invasion of another authority's territory, it should be borne in mind that the measure was a comprehensive one, in which it was imperative that adjoining property should be considered. There was always a right of appeal to the Board.

Mr. Leslie Vigers, President of the Surveyors' Institution, in closing the meeting as chairman, expressed satisfaction with the Act. It would at any rate enable individual owners to force schemes on municipalities through the Local Government Board. He himself was connected with a case in Croydon where for three years he had been endeavouring to get a scheme adopted. He had hitherto failed because the property lay in the districts of three local authorities, and it was impossible to get all three in the same mind at one and the same time. He had now a ray of hope that with the help of the Act he would succeed in getting the scheme carried through.

Wednesday, October 12.

Town Planning and the Preservation of Ancient Features.

In a lengthy paper Professor G. Baldwin Brown, M.A., Hon. A.R.I.B.A., advocated respect for the old principle that in the laying-out and alteration of our towns utilitarian considerations should not override the claims of beauty and of historic association; that zeal for city improvement and extension should be tempered with a conservative care for older monuments and for those natural features which give individuality and charm to civic and suburban sites. This is a matter on which we cannot afford to let our local authorities alone; we must watch their proceedings with vigilance, and invoke and educate a public opinion that will guide and control them aright.

Even the enlightened town-planning enthusiast needs some watching. There is a significant sentence in a recent book by one of these, in which the writer exclaims: "It is so infinitely easier to achieve the hygienic, artistic, and economic objects of town planning when starting with a clean slate that one would like to see our overgrown towns done away with, and new ones built in their stead, if only this were possible."

The "clean slate" has a fascination for many people, especially for the capable administrator dominated by a theory. Theoretical town planning, we should not forget, is nothing new. On a vast scale, and inspired by these same hygienic, artistic, and economic ideals, it is at least as old as Nebuchadnezzar. It is, indeed, very much older, but Nebuchadnezzar's Babylon is one of the first conspicuous examples of consistent and deliberate town planning about which we have historical details, and as this four square city, with its garden suburbs, was evidently the model for the New Jerusalem of the Apocalypse, it is the plan that is likely to survive the longest, so that the mansions in the skies of the well-known hymn will all be found grouped on Nebuchadnezzar's rectangular scheme. And not town planning only, but doctrinaire town planning, belongs to the ancient world, and we can trace quite early the notion, to which expression has been given in modern times, that straight and regular streets will inspire citizens with the spirit of rectitude and order. With this end in view as early as the epoch of Pericles, Hippodamus of Miletus, in the spirit of the pedagogue, super-imposed on the broken and hilly site of the Peiræus the Babylonian scheme of straight streets and rectangular intersections, just as in our own epoch Napoleon III. straightened out old Paris.

The increasing evidence of the solicitude of the British Government for the safeguarding of this portion of the national assets is an encouraging feature of our time. It is significant that neither in the "Housing of the Working Classes" Act of 1890 nor in the amending Acts of 1900 and 1903 is there any reference to ancient monuments, or to the possible artistic or historical value of structures scheduled as "obstructive buildings" under clause 38 of the Act of 1890. On the other hand, in the "Housing, Town Planning, &c.," Act of 1909 there is the refreshing clause 45, which begins: "Nothing in the Housing Acts shall authorise the acquisition for the purposes of those Acts of any land which is the site of an ancient monument or other object of archæological interest"; while the schedule attached to clause 55 includes under the general provisions which the Local Government Board may prescribe for carrying out the objects of town-planning schemes "the preservation of objects of historical interest or natural beauty." It should be pointed out that our Government is in this following the example of some of the more enlightened administrations of the Continent, notably those of France and Prussia, and the action which these and other legislatures have taken is

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an encouraging evidence of the trend of educated opinion in Europe generally.

The recognition by our own Government in the recent Town Planning Act of the national importance of this preservation of ancient features carries with it a logical consequence, on which a word may be said. It is obvious that there will now rest upon all the various departments of the British public service, concerned in building or pulling down, the obligation to assist in a loyal spirit in carrying out in matters of detail the expressed policy of the administration.

The following appear to be the practical possibilities of this situation. Now that the British Government is in a measure committed to responsibility in these matters, it would be of the utmost value for the future if it were made a part of the public duty of inspectors and other officials of the same grade, who have local knowledge of the details of operations under the various departments, to report especially on the relation of such operations to the amenity of the district they affect. It would then be left for the higher and more responsible officials to consider possible modifications of the scheme in question, with a view to preservation. Now that our administration has followed in its legislation the present practice in these respects of the most enlightened European peoples, it would not be unreasonable if this Congress were to appeal to our rulers to advance a little farther in the same direction, and issue those directions to subordinates which are such encouraging features of Continental practice.

Cities of the Present as Evolved from the Past.

Mr. Charles Mulford Robinson, Rochester, N.Y., U.S.A., in his paper on "Cities of the Present as Representative of a Transition Period in Urban Development—The Evidence of Standardising Streets," characterised the city of the present as the town of the past at, generally speaking, an ungainly age, sometimes grown in size, but not adjusted to new conditions. Let us take as illustration one very simple, though very important, matter that is within the memory of us all. Not in the picturesque mediæval city only, but in the city of our own remembrance, it was necessary that the workman live near his work. That necessity is passing. It now applies only to the labourer who is most poorly paid, and, in less degree, to those whose labour calls them to work at unusual or uncertain hours, as, for example, dock handlers.

This is the triumph of the modern city. It has come with the quickening and cheapening of urban mechanical transportation. It is the relief which has been developed as a blessed offset to the increasing pressure of modern industrial and commercial activity. At last it has become possible for the citizen to get away from work.

Obviously, this is a social readjustment of incalculable value. But it has expressed itself very inadequately on the city plan. Though business sections and home sections have become divorced, and consequently have developed entirely different traffic requirements, yet, generally speaking, the street plan has remained unchanged. And even these great divisions have developed various characteristics of their own, so that they, in their turn, may be sub-divided into distinct districts, as far as the true requirements of lot-size and street-capacity are concerned. But still we keep streets mostly uniform in width and we standardise the unit of lot. Rapid-transit railways have been created, but they must seek the suburbs by thoroughfares that have scarcely changed in character in hundreds of years. Indeed, the centuries have brought only one marked change, and that—which is the wholesale widening of streets in the cities' newer parts—is really of questionable value. Thus the average city's lay-out may be said to make scarcely any recognition of the tremendous social change which has come with the labourer's wish to live away from his work and his recently acquired ability to do so.

Adequate recognition would involve two groups of changes, and these, when made, or if made, must definitely differentiate the city of the present from the mediæval town, and even from the city of the last century. These changes would be, first, the provision of long, straight, broad radial highways of easy gradient. Such thoroughfares, shortening time and distance to the outer zones, would facilitate the daily ebb and flow of travel and would increase the area available for home-building. Second, the changes would involve a re-arrangement of minor streets, adjusting them to the needs of the sections which they serve, largely new needs in home sections.

In the built-up portion of most cities of the present the area devoted to streets is from 25 to 40 per cent. of the total. In mediæval cities it was frequently about 10 per cent. Recognising a new requirement, we have raised the proportion; but we have done this in a uniform, unthinking way. We have made the ridiculously impossible attempt to imagine an "average street," and then, having guessed at a width and arrangement that would be theoretically suitable for this, we have sought to save ourselves trouble by enacting legislation to standardise it.

To illustrate concretely, let us take the Borough of the Bronx, New York—a region of delightfully varied topography, and illustrating within its considerable area almost every kind of suburban development. Yet here a general ordinance dealing with the arrangement of streets requires that all streets 60 feet wide shall have a 30-feet roadway, all streets 80 feet wide a 42-feet roadway, any street 100 feet wide a 60-feet roadway, &c.—without regard for any characteristic of the street, save that of width. For example as to the other aspect of the matter one may turn to the city of Washington, which we like to think of as so admirably planned. There a law requires that all new streets shall be not less than 90 feet in width.

Consider the economic loss involved in such "mechanical standardising"—this is of two kinds, and it is all reflected in the rent. In part this loss is represented by the actual municipal outlay for the paving and maintenance of the unnecessary street-space; and in part it is represented by the increase in rent traceable to the amount of building land taken out of the market in order to supply the needless street-space. It may be well to quote figures, as generally the connection has not been thought out. In the Richmond (England) housing scheme, "taxes and insurance" are estimated to account for one-fifth of the rent of a six-room cottage. "Housing Up-to-Date," that valuable compilation by Mr. W. Thompson, chairman of the National Housing Reform Council of England, states that the cost of roads, sewers, &c., reaches in some cases as high as 9*l.* per room, or 45*l.* per cottage, and that it averages 9*l.* per cottage. This calculation is based on statistics covering thousands of cottage dwellings, and since the word "cottage" means in this connection houses built in continuous rows—that is, dwellings that occupy with their grounds a minimum street frontage—it reveals the effect on rents for even the cheapest homes. As to the more costly villa type of dwellings, the same authority notes that the English by-law requiring a paved or macadamised road surface of about 40 feet for all except secondary streets has made the cost of such thoroughfares, in newly developed estates on the outskirts of towns, from 200*l.* to 500*l.* per acre—"*or more than the land itself.*"

We may note the inconsequence of making footpaths almost always double on a street, no matter how little walking there may be; or of making them always co-extensive with the roadway. Both these acts are mere survivals. Among villas with considerable grounds on sites of picturesque and irregular topography, would not the people be better served, and the region made a hundred times more attractive and parklike, if secondary streets were not merely narrower but less frequent, while footpaths were at nearer intervals? Should we not by this means create very simply and practically a *rus in urbe* of a most serviceable kind—even a "garden city" for the well-to-do and middle class whom, in such great numbers, the city still must hold?

It is the universal modern practice in good road-building through country districts, to put a good surface on a comparatively narrow strip rather than a cheap surface on a wide strip. This, it is considered, serves the traffic better and with more genuine economy. May we not learn also from this conclusion? From the standpoint of the traffic to be served, the secondary street in a residence section is much more nearly akin to the rural highway than to the city's business thoroughfares.

The Building Laws of Paris.

M. Louis Bonnier, Architecte-voyer-en-chef de la Ville de Paris, Président de la Société des Architectes diplômés par le Gouvernement, read a Paper entitled "Notes on the Rules and Regulations of the City of Paris Relative to Architecture." There are thirty-one by-laws or ordinances which regulate questions of architecture in Paris. The first in date applies to the Place des Vosges. On August 5, 1605, Henry IV., when engaged with Sully in the reorganisation of his kingdom, and endeavouring also to introduce some regular plan in Paris, even at the expense of mediæval picturesqueness, resolved, for "the convenience and embellishment of the town," to lay out upon the old horse market-place a large, open square measuring 273.50 metres each side.

In order to preserve the *ensemble*, and so that each house

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should remain in possession of the same owners, the edict of 1605 provides that each tenement shall remain perpetually indivisible, and this is why one of them is still, after 300 years, in the possession of the family that built it. The Place as a whole has retained its harmony of colouring and its noble and imposing symmetry.

In the same spirit Henry IV., two years later, gave to the President of Harlay a lease of the ground made up of the two islets in the Seine, one of which forms the "Pointe de la Cité." The lease was granted subject to "said first President causing said grounds to be built upon according to the drawn plan and specification thereof." Unfortunately, this splendid scheme does not appear to have ever been fully carried out.

In 1669 the Rue de la Ferronnerie was occupied by shops, the backs of which adjoined the charnel-house of the Cimetière des Innocents. Louis XIV., with a view to increasing its width to 30 feet, ordered that the Chapter of Saint-Germain-l'Auxerrois should have these walls replaced by a large building entirely occupying one side of the new street. The King decreed at the same time that all the sums due by the Chapter concerning the extension of the Louvre, up to the sum of one hundred thousand livres, should be applied "as to one half to the erection of houses in the Rue de la Ferronnerie, and as to the other half for such ornamental purposes and at such places as it shall please His Majesty to order."

In 1684 the Maréchal Duc de la Feuillade, wishing to provide a circular and ornamental space in harmony with the superb statue of Louis XIV., bought ground and started the Place des Victoires according to drawings by Jules Hardouin Mansart. The contract bound the owners of the houses around the square and their successors to keep up the frontages in the same condition, without "ever making any changes therein." During nearly the whole of the nineteenth century successive attacks were directed against this admirable ordinance. In 1698 Louis XIV. caused the buildings that had been started in the Place Vendôme to be demolished, and ordered the works to be resumed according to Mansart's plan, which provided for its present octagonal shape.

In order to clear the approaches and to open to view the church, which he built towards the end of the eighteenth century, the architect Servandoni had drawn the plan of a large space which he intended to enclose with houses of a uniform style. In accordance with this order, the building of the presbytery was commenced at No. 6 in the square. Unfortunately that it was actually laid out with dimensions practically the same as those set out by Servandoni, it was done without any architectural prescriptions, and hence Paris lost the opportunity of having a square which had been planned by the originator himself of the monument which was to be its principal *motif*.

As far back as 1670 the plan of Bullant and Blondel shows an interesting scheme for constructing a square among the timber-yards which then occupied the present space taken up by the Place de la Concorde.

However, it was not until 1763 that the works were at last started, after the design drawn by Gabriel, who at the same time built the two splendid ornaments of the Garde-Meuble and the Ministry of the Navy.

A decree of the Consuls, signed by Bonaparte, who was anxious to isolate the Tuileries, provided for the construction of a street to occupy the whole width of one of the courts of the old Palace, and to cut it off from the buildings of the Rue Saint-Honoré. As to the roofs, which have been the subject of such lively debates, apart from the fact that they appear to have received but scanty attention from the architects who produced the original designs, they exhibit the greatest variety of style in their construction, and, always ignored by ordinances, they were left to the Common Law. This, it should be observed, is how Napoleon I., as far back as 1811, understood the meaning of the edict of the Consul Bonaparte, when he approved a scheme for the building of the Ministry of Posts with a vaulted roof. It should be further noted that the compulsory style of architecture imposed upon the Rue de Rivoli is also applicable to the Rue Castiglione and the Rue des Pyramides, which form a uniform and indefinite series of repetitions, though none the less imposing on account of its extension.

The Restoration, the July Monarchy, and the Second Republic condemned and destroyed, in pursuance of most deplorable alignment decrees, a large number of interesting monuments which belonged to old Paris. But Napoleon III. made not only compulsory architectural rules for dealing with limited spaces, like the Louis XIV. and Henry IV. squares, but he also carried out improvements in the general plans of Paris, like the construction of large thoroughfares with plantations, the opening of parks, squares, &c., which under Haussmann's guidance may, perhaps, be regarded as the first manifestation of town-planning.

It is again to Napoleon III. that is due the honour of having created in Paris the first of those great thoroughfares lined with "non aedificandi" zones and bordered with compulsory fields. The owners are subject to all the ordinary obligations and, furthermore, to what is called the "Grille de Clôture" (enclosed railings), and to the private dwelling clause; they are forbidden from carrying on any trade or industry, and obliged to build ornamental gables. This is an excellent measure, which has been responsible for the beauty of these new quarters, and which it would have been well to adopt again.

Since 1870 one style of architecture only has been compulsory, viz. the style which was to apply to the approaches of the Business Exchange, and which became the subject-matter of a contract with a building contractor. The latter had undertaken to raise upon the land sold to him houses of a type approved by the authorities. He built them, but he greatly departed from the rules prescribed.

Two-thirds of the architectural servitudes in Paris have nearly all been complied with, and the abandonment of the others is the work of previous periods, if not of the originators themselves. They have experienced the fate of so many other marvels which are so plentiful in Paris, and which ignorance and lack of artistic sense have put down to the imperative demands of the unavoidable evolution of cities. Fortunately, for some years past, and under the influence of artists and archæologists, public opinion has rebelled against these destructions, mostly unwarranted, and a healthy reaction is now tending to bring the authorities back to a sense of respect for the artistic creations of the past.

(*Continued on page* 16 *of Supplement.*)

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

The R.I.B.A. Town Planning Conference.

Sir,—"Those whom He loveth He chasteneth," says Scripture, and I trust I am right in attributing the severity of your remarks in this week's issue to the same sincere regard for me that I bear towards you.

But may I plead in mitigation of my doubtless well-deserved castigation that the order of all the principal proceedings was set out in the "Preliminary Announcement," issued some months ago, and, I fear, consigned to the "W. P. B." by too many members of the profession, who, despite the repeated notices in the *Journal* and special circulars, have deferred "sending in their guineas" until the last few days, and thereby taxed the energies of the "numerous committees and hardworked staff" to breaking-point?

That the dates of the excursions were fixed as soon as possible can hardly be an aggravation of my offence in not issuing the complete "Diary" before it was possible to do so; and I think you will be pleased to find that your doubts as to the success of the Conference are not realised. The only trouble has been to deal with the flood of applications for membership.

I am not concerned to justify myself. I realise that in accepting such a task I expose myself to just reproach in case of failure; but your criticisms are deeply felt by the devoted staff of the Institute, whose efforts I can never sufficiently acknowledge.

So, *sans rancune*, dear Sir, I acknowledge and thank you and the general Press who have so greatly aided my work in organising this Conference at rather short notice, and remain

Yours truly,

John W. Simpson,
Secretary-General.

Devonshire Club, St. James's, S.W., October 8, 1910.

[We have too high a regard for the efficiency of the Royal Institute and all its activities to desire to prophesy only smooth things, and we appreciate highly the kindly spirit in which Mr. Simpson has taken our fault-finding. In the organisation of the present Conference the Secretary-General, his committees and staff have achieved so great a success that Mr. Simpson might excusably develop a swelled head, from which calamity we trust he may be saved by the criticism of candid friends and the recognition of the few particulars in which perfection has not been completely attained.—Ed.]

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The Architect.

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FORTHCOMING EVENTS.

Friday, October 21.

Town Planning Exhibition at the Royal Academy : Closes October 22.

Leighton House : A course of six Friday lectures on Venetian Painting, by Mr. Beckwith A. Spencer. Opens at Leighton House, 12 Holland Park Road, W.

Monday, October 24.

Architectural Association : Mr. Edwin Gunn on "The A.A. Excursion to York and District, 1910."

Thursday, October 27.

University College, London : First of a course of eight public lectures on English Domestic Work, by Mr. J. A. Gotch. (1) "Keeps and Fortified Manor Houses."

Camera Club : Mr. H. W. Fincham on "Canterbury Cathedral."

Friday, October 28.

Glasgow Technical College Architectural Craftsmen's Society : Professor C. Gourlay on Elementary and Advanced Building.

PETROL AIR-GAS.

THEORY AND PRACTICE OF THE NEW ILLUMINANT.

By Professor C. A. M. Smith, M.Sc.

(*Continued from page* 234.)

Quantity of Liquid Capable of Absorption by Air.

In order to see to what extent different liquids are capable of absorption by air the curves shown in fig. 2 have been plotted from the researches of Young (paraffin group) and Kahlbaum (benzene and toluene).

The method of calculating the weight of liquid absorbed by a cubic foot of air from these curves is exemplified as follows :—

Taking the case of hexane (C_6H_{14}) from the curve the vapour pressure of this liquid at, say, 15° C. is 95 mms., and at −5° C. it is 34 mms.

The vapour density relative o hydroge is half the molecular weight—

$$= \frac{(6\times 12)+14}{2} = 43.$$

But the weight of 1 cubic foot of hydrogen at 0° C. and 760 mms. = .00559 lb. Hence weight at 15° C.

$$= \frac{274}{274+15} \times .00559 = .00530.$$

Hence the weight of 1 cubic foot of hexane vapour at 15° C. and 760 mms. = 43 × .0053 = .232 lb. Consider now a box containing 1 cubic foot of space, and let it be vacuous. Then introduce hexane liquid and the pressure becomes, as shown from the curve, 95 mms.

But it has just been calculated that 1 cubic foot of vapour at 760 mms. weighs .232 lb. Hence weight of 1 cubic foot at 95 mms.

$$= \frac{95}{760} \times .232 = .0290 \text{ lb.}$$

Now, if air be admitted to the box till the pressure is 760 mms., we know from Dalton's Law that the pressure of the air must be such that

Vapour pressure + air pressure = 760 mms.

Whence pressure of air = 665 mms. But weight of 1 cubic foot of air at normal temperature and pressure is .0807 lb. Whence weight of 1 cubic foot at 15° C. and 665 mms.

$$= \frac{274}{289} \times \frac{665}{760} \times .0807 = .0669 \text{ lb.}$$

Therefore .0669 lb. air mix with .0290 lb. of petrol vapour to form 1 cubic foot of saturated air-gas weighing .0958 lb. It will be observed that the gas is heavier than air.

Also, since .0669 lb. air absorbs .0290 lb. of hexane (at 15° C. and 760 mms.), .0765 lb. must absorb

$$\frac{.0765}{.0669} \times .029 = .0332 \text{ lb.}$$

Table I. shows the calculations for all the leading constituents of commercial petrol.

Now, when we have a mixture of these liquids we should, if Dalton's Law were strictly accurate, get a vapour pressure equal to the sum of the vapour pressures of the constituents. Another way of putting this statement is, that after a cubic foot of air has absorbed all the possible amount of, say, hexane it can still absorb a quantity, say, of heptane.

Actually, to calculate theoretically the amount of a sample of petrol which could be absorbed by a cubic foot of air, given the exact analysis of the petrol, would be very complex and would serve no useful purpose; for, in the first place, it would be necessary to assume the exact truth of Dalton's Law, and, in the second place, no two samples would give the same analysis.

We can state, however, that the quantity absorbed would be greater than that given in Table I., but these numbers serve to give a comparative illustration of the effect of varying densities and temperatures.

Fig. 3 shows the relation between density and pounds of liquid absorbed by 1 cubic foot of air.

Professor Boverton Redwood has obtained some experimental values, which may be expressed as follows :—

Table I.—*Determination of Amount of Liquid Necessary to Saturate Air at* 15° C. *and* −5° C.

Name.	Density of Liquid.	Vapour Density.	Vapour Pressure.		Weight per Cubic Foot at 760 Mms.		Weight per Cubic Foot at Vapour Pressure.		Weight of Air which Mixes with Vapour to Form 1 Cubic Foot of Gas.		Weight of Liquid Absorbed by 1 Cubic Foot of Air.	
			15° C.	−5° C.	15° C.	−5° C.	15° C.	−5° C.	15° C.	−5° C.	15° C.	−5° C.
			Mms.	Mms.								
Normal pentane (C_5H_{12})	.600	36	347	144	.194	.205	.0885	.0388	.0416	.0665	.1630	.0479
Iso-hexane (C_6H_{14})	.677	43	158	61	.232	.245	.0483	.01965	.0606	.0755	.0610	.02135
Normal hexane (C_6H_{14})	.664	43	95	34	.232	.245	·0290	.01095	.0669	.0785	.0332	.01143
Normal heptane (C_7H_{16})	.700	50	28	8.5	.270	·284	.00995	.00317	.0737	.0812	.0139	.00320
Octane (C_8H_{18})	.703	57	7	2.0	.302	.324	.00289	.00086	.0758	.0820	00292	.000861

All weights given in pounds.

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Temperature 60° F. (15.5° C.)

Substance.	Pounds Absorbed per Cubic Foot of Air.
Gasoline (0·639)	.236
Petroleum spirit (0.679) . . .	.0764
Petroleum spirit (0·700) . . .	.0744

He also gives the effect of varying temperature as follows:—

100 vols. of air at 32° F. will retain 10.7 per cent. gasoline vapour of 0.65 density.

100 vols. of air at 50° F. will retain 17.5 per cent. gasoline vapour of 0.65 density.

100 vols. of air at 68° F. will retain 27.0 per cent. gasoline vapour of 0.65 density.

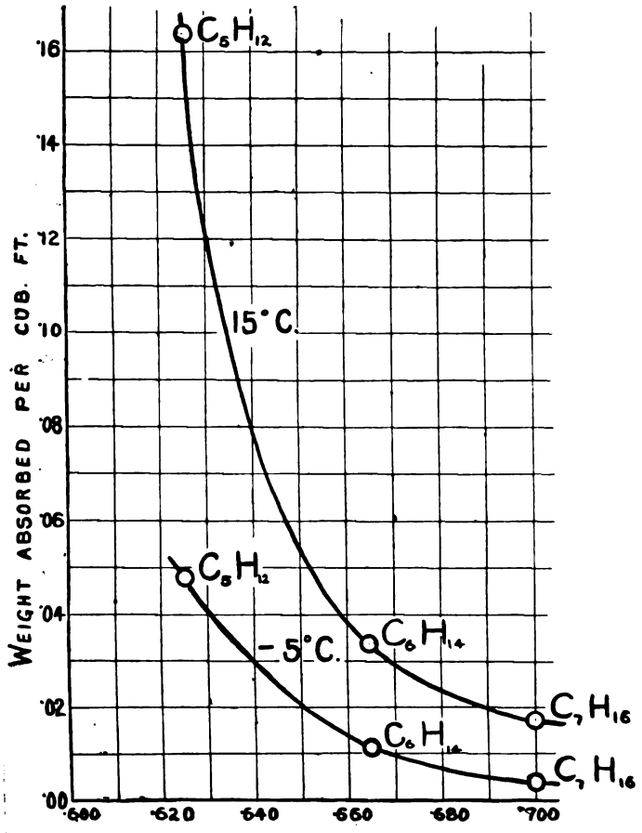


FIG. 3.

These are hardly comparable with theoretical values obtained above, but it will be seen that, at 68° F., air retains 2.62 times as much as at 32° F.

From Table I., air at 15° C. (59° F.) will retain 2.9. times as much hexane vapour as at −5° C. (23° F.).

(*To be continued in our issue of November* 4.)

Erratum.—In our issue of October 7, p. 233, the sixth paragraph on second column should read:—Recent research by Professor W. A. Bone has shown that combustion is by no means the simple direct combination such as might be expressed in the case of pentane

$$C_5H_{12} + 8O_2 = 5CO_2 + 6H_2O.$$

THE TOWN PLANNING CONFERENCE.

(*Concluded from last week.*)

Thursday, October 13.

OWING to the large audiences it was found necessary to continue the overflow morning meetings on the two last days of the Conference. On Thursday morning the papers were grouped under the heading of

City Development and Extension.

The Chairman in the Great Gallery was Mr. Daniel H. Burnham (Chicago), and in the East Gallery, Councillor Galbraith (Glasgow). The first of the five papers mentioned on the programme was by Mr. Raymond Unwin. It was entitled

The City Development Plan.

Mr. John Burns's Town Planning Act has, said Mr. Unwin, wisely concentrated the attention of town planners in England mainly on the development of the still unbuilt-on areas round the existing towns where the greatest damage is now taking place. We must, however, not suppose that we can consider the suburban areas by themselves. City planning really involves the whole problem of the proper organisation of city life. We must look forward to the time when, having put on right lines the present development, it may become well worth while for the city to undertake to remedy at least the worst defects which have sprung up for want of proper planning in the past.

The first thing to be done in relation to the extension plan is to determine the general lines on which the city should be encouraged to develop; determine which areas it is important to reserve for industrial purposes, for providing new railway accommodation, docks, harbours, warehouses, &c., and which should be devoted to residences of various classes. It is important that as much intermingling of classes as possible should be brought about in the suburban districts.

In considering the general form which it is desirable that town development should take, two extremes may be mentioned. Either the town may extend in solid continuous rings, like the rising of flood-water in a shallow basin, or it may increase by the growth of numerous detached townlets spreading from some centre, such as an existing village or a railway station, on the outskirts of the town.

In all large organisations it becomes necessary to subdivide into smaller units, having distinctive functions in relation to the whole, and to subdivide these further into smaller units still. So it is with the functions of city life: a few may be entirely centralised, but most of them must have local provision made as well, and it is much more healthy that the various local provisions should be grouped together to form definite supplementary centres near to the population that is to use them, rather than that they should be scattered indiscriminately over the town. Such centres become naturally the points of emphasis in the design, making it possible to introduce scale and proportion in the different parts and concentration of architectural effect in the centre point or climax. If towns of great size are to be wholesome dwelling places, it seems necessary to adopt one of two courses. Either we must give to every house a considerable extent of ground or we must develop on the principle of grouping our buildings together in certain parts and leaving adequate open spaces around each group. This latter seems both the right and natural course. City life is essentially co-operative in character, and the ideal of city life will not be the setting of every individual house within its own quarter-acre plot of garden, but rather the placing of groups of houses within their own hundred acres of park.

The next step in preparing the city development plan will be to consider the highways required for intercommunication between all these centres and the heart of the town itself or its industrial district, and also between these different centres themselves. The real economy of any town plan will greatly depend on the proper arrangement of its main highways—on the right spacing and the sufficient grading in width and character of all the roads.

Hitherto it has been the general custom in this country for our by-laws to fix one minimum width applicable to all new roads, and there has been a tendency to increase this from about 36 feet up to about 50 feet. But, while either of these widths is ridiculously inadequate for the main thoroughfares in any large town, the greater of them at least is so excessive as a means of giving access to a group of houses that already the cost of these wider roads has become one of the causes tending to produce either the overcrowding of houses on the site or the creation of flat dwellings. If we are to carry out sensible town planning, we must accept at once the principle that roads should be of varying and construction widths, according to the purpose they are to fulfil. Between the suggested two extremes of the 20-foot carriage drive and the 150-foot multiple-track highway there will be room for roads of almost every width and the greatest variety of character and treatment.

Having settled the purpose of different areas, determined the general character of growth and the approximate directions desirable for main and subsidiary highways, the town planner finds himself with the following component parts out of which to make his design—namely, the main centre-point or climax dominating the whole, the secondary centres in definite proportion and relation to it, and the main highways linking them up, the whole giving the bones or main framework of the design. It is necessary to allow for the proper varied treatment of the different detailed portions of the town plan to accommodate the buildings to the various uses to which they may be allotted and the varied arrangement required by the local characteristics of the site. In

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America the whole of the town is planned in relation to the smallest unit—the building block; in consequence it consists primarily of a mass of detail framework having no relation to anything but itself.

No system cuts up the land into more awkward corners, or more thoroughly destroys the street façades than that which consists of a framework of diagonal highways laid upon a rigid gridiron system of minor roads, and from no system do such unsatisfactory road junctions result. In town planning it is essential to avoid being carried away by the mere pattern of lines on paper. The importance of so designing the plan of a town that interesting and beautiful street pictures can be created has been very fully recognised by the Germans in the strong reaction which has taken place against the geometrical style of town planning which they followed in the early years of the modern revival of the art.

In taking a general survey of town-planning work, one cannot but feel that the different schools have been hampered by theories of formalism and informalism which have become prejudices without the real conditions of either being entirely grasped. Generally in town planning there can be no such thing as complete formality such as you may show on a paper design.

The Dark Town as it is To-day—The Luminous Town as it Shall be To-morrow.

Monsieur A. Augustine Rey, Paris, read the second paper of the morning, and said:—

The expenses of the towns are always getting higher. The conditions of living in modern cities are usually based on the fictitious value given on the land. There ought to be a stop put to this continual rising of the value of the land in large towns. The English cottage is the result of the non-speculation of land and it is a national glory for England. The house of fifty-two storeys is the result of the folly of speculation in America and it is an economical shame. The important thing for municipalities is to keep a jealous eye on their land possessions and to augment them as much as possible. But they must not build on them themselves. The principal factor of the tuberculosis contagion is certainly the overcrowded state of certain parts of the cities where the lower classes live. If one could establish the exact proportion of this factor in the ruin that tuberculosis accumulates around her one would certainly be astonished at the high price that land speculation imposes upon the whole of society. Towns seem to be destined to further extend themselves. How ought the evolution that sends the population from the country into the towns to be coped with? The climatic conditions of each country must necessarily be at the basis of their way of living and especially of their methods of building. It is a great and common mistake to want to apply to one's own country immediately what one has seen in other countries.

It is of first importance for the public authorities to endeavour to ameliorate the public health by trying to stop the speculation on city sites. In that way they will be enabled to create more open space around the houses, and also render the habitations themselves more and more accessible to light and air. The town architects ought to make a reasonable plan and section of the whole. The town should not be an inextricable block. One can divide a town as follows: (1) The business part; (2) the industrial part; (3) the part containing the buildings for administration; and (4) where the people live. The exaggerated centralisation which has created the large cities is a fundamental error. In powerful nations the centres ought to be numerous. England gives a good example in that respect. The application of the law of town planning will certainly accentuate this tendency. The part of the city to which England has attached the greatest importance is the residential. England has created admirable types, and has made an heroic defence of its national cottage against the ever-invading tenement buildings. It is the same feeling which has made England fight for free trade against the protectionist Continent. "One house, one family," has been the motto of Great Britain, and they have stuck to it. It is, said Monsieur Rey, a great mistake to throw away the public money on monumental buildings which do not meet an absolute necessity. One striking example has occurred at Antwerp. This remarkably picturesque city has built lately a principal station which has cost the enormous sum of more than two million pounds sterling. Instead of being a reasonable building the erection of what we might term a Palace of Smoke is a monstrous mistake. When one thinks of all the necessary outlay which ought to be made in a town like Antwerp to improve the hygiene and the organisation of the city, one is astounded at the want of reasoning which has allowed the authorities to permit the spending of so much money in such an unnecessary way. The beauty of a town principally consists of the beauty of its traffic lines. Another most important factor is the orientations given to the principal roads. Nobody can contest that the beauty of a building is enhanced by the play of light and shadow. In the great period of art in the oldest of Asiatic and African civilisations, this law of orientation of the building had never been forgotten. But it is not the same nowadays. The sun is, by all scientific proofs, the great element of health and destroyer of microbes; it is also the great factor that will enhance the beauty of all architectural conceptions. All the great monuments in former centuries had been conceived on that principle. We can give as an example the Place de la Concorde in Paris. Its admirable buildings have all been conceived and studied so that the light should accentuate their beautiful outlines. No error has been made in that study, and the Place de la Concorde has been universally recognised as being very near perfection. Let that example show us the absolute necessity of studying that most important law of light so intimately connected with the beauty of monuments and towns. The fundamental basis of town planning must be the orientation given to each of its separate elements.

The Development of London.

Under the title of "City Development" a paper was read by Mr. W. E. Riley, F.R.I.B.A., R.B.A., M.Inst.C.E., superintending architect of Metropolitan buildings, and architect of the London County Council. It dealt almost exclusively with the metropolis.

London, said Mr. Riley, may be regarded as a most costly example of the lack of proper appreciation of the aims which this Conference is convened to promote. The London County Council, up to December 1909, effected, or was in course of carrying out, 133 improvements, estimated to cost 8,559,516*l.* net. It also agreed to contribute 1,455,120*l.* towards 486 local improvements. The net amount to which the Council was committed since its constitution in 1889, without deducting the contributions to be made by local authorities, averaged 500,732*l.* per annum, the total length of improvements undertaken being about thirty-one miles. The Council's predecessors, the Metropolitan Board of Works, between 1855 and 1889 expended 10,113,392*l.* (net) on constructing new and widening old thoroughfares, and also paid over a million towards local improvements. The outlay of the City of London and the local authorities from 1856 to 1889 was over a million sterling, and these bodies are now spending annually from 40,000*l.* to 50,000*l.* with the same object. The City Corporation has also recently initiated works of considerable magnitude, estimated to cost nearly three-quarters of a million sterling.

We cannot evade the uneasy feeling that the result is utterly inadequate. A map indicating roads 60 feet and upwards in width clearly shows that London is still without any *motif* of systematic development or without proper street facilities for communication with suburban, or rather extra-urban, districts. Paris has forty-two roads radiating into the surrounding country; London, with a population twice as large, has only twenty. Paris has 102 miles of streets 98 feet or more wide; London has only 8½ miles in all of streets of that width.

The fundamental defect in London development has undoubtedly been that no practical attempt has been made to control extension on any systematic plan.

The want of system has not been confined to street development. The location of the railway termini in London affords an equally flagrant example of disregard of the most elementary principles of town-planning. A Royal Commission reported in 1846 against a proposal for a great central station in London, but recommended that if railways were hereafter admitted to the centre, this should be done in conformity with a uniform plan. It is instructive to consider how absolutely this recommendation has been ignored.

Closely connected with the want of a systematic plan is the indiscriminate intermingling of manufacturing and residential districts in London. The squalor and overcrowding of districts within the central area are directly attributable to the want of such regulations.

The actual cost which has fallen on the rates up to March 1908 in clearing insanitary areas and rehousing persons displaced has been nearly 2½ millions sterling. These deplorable results would have been impossible if foresight had been exercised in confining manufactories to particular parts of the town, the workers being housed in healthy surroundings which wide streets would have rendered easy of access.

A third reason for the existence of the evils has been the inadequacy of the building laws. Hitherto the evolution and extension of Inner London have been controlled to a

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limited extent only, the requirements as to width of streets and space about buildings contained in the Building Acts being very restricted in scope. Many of the conditions have proved to be utterly futile for regulating the general development of building estates. It has been urged that borough engineers and surveyors are responsible for the chaotic arrangement of streets which has prevailed in the past, but that is not the case.

The garden squares and open spaces of London, which in their variety and extent are unsurpassed, may be considered to be the most satisfactory feature of its development. In Greater London the Government maintains 5,985 acres.

There are 114 open spaces under the control of the London County Council, with an area of 5,100 acres. The City Corporation maintains nearly 6,500 acres. Further, there are 437 private squares and enclosures, with an approximate area of 447 acres.

In the County of London about 5,000 new buildings are being erected each year. But the County of London, with its 75,000 acres, forms, however, only a small part of the actual town as it exists at the present day. The Royal Commission on London Traffic in 1905 went much further afield, including in its investigations an area covering 692 square miles. It is estimated that in 1931 the population of Greater London will almost reach the colossal figure of eleven millions. What has occurred in the past is slowly but surely repeating itself, and the Town Planning Act will have accomplished some good if it only forces on the public notice the urgency of the problem as to whether this great but unavoidable development is to proceed on rational lines, or in the same unregulated and incoherent manner as in the past. The existing outlets of Greater London show that something is required immediately.

How any action is to be taken forms a problem almost as complex as what that action should be. Under the Town Planning Act the London County Council is the local authority for the county of London. Outside the county the local authority is the council of any borough, or of any urban or rural district. It is not evident which of these very numerous local authorities is to initiate the comprehensive scheme; and although the Act aims at co-operation, anyone with experience of public authorities must have misgivings as to the possibility of agreement being arrived at in time to prevent the mischief which all desire should be avoided. The preparation of a comprehensive town-planning scheme for London, however desirable, is a work of great magnitude, which would involve considerable expense and probably occupy a much longer time than is expedient under existing conditions.

The most pressing need is to establish the main arterial communications on a large and courageous scale to provide for the inevitable expansion of the next one or two decades, so that the necessary outlets into the country may not be stifled or obstructed, and that the gradual extension which is now proceeding may adapt itself to the lines laid down. It is most undesirable that the beautiful parts of south-east London which remain uncovered should be built on in the same uninteresting manner as other districts in the same quarter. To solve the problem of controlling the future growth of London and to secure proper development, singleness of action is absolutely essential.

A Joint Select Committee of both Houses of Parliament in 1901 suggested the desirability of some central control of all projects affecting the relief and distribution of traffic in or near London, and the Royal Commission on London Traffic in 1905 emphasised the same point. This part of the question is, however, one of policy, with which this paper is not concerned, and in which the author has no desire to intervene, but attention should be drawn to the seriousness of employing anything but unified treatment in dealing with so great an issue.

Recent Progress in German Town Planning.

Herr Dr. Stuebben read a short paper on the progress of town planning in Germany during the last two centuries, which took the form of a commentary on an exhibition of lantern slides. He said:—

Paris used to be our first teacher. The symmetrical French style was predominant in Germany until the eighties, when architects began to abandon straight lines and the uniform style in favour of variety and curved forms, and to study the mediæval German towns more than they had ever done before. This fondness of curved forms naturally led to many eccentricities. To-day we have come back to a more sober conception, and we estimate the curved and straight lines, as well as the symmetrical and the unsymmetrical, at their real value.

If we examine the finest streets of the mediæval towns, we find that they follow relatively light curves, of which the following are examples:—

Anger-Strasse in Erfurt.
Maximilian-Strasse in Augsburg.
Altstadt-Strasse in Landshut.

The influence of these old towns upon the two new streets in the plan of the modern towns is seen in the Arnulfstrasse in Munich, by Theod. Fischer, and the Fischereistrasse in Brünn by myself.

Dr. Stuebben then showed a few modern schemes for the construction or extension of new districts, proposed partly by himself and partly by other German architects, illustrating more in detail the present position of the town planning question in Germany.

The fishery quarter in Brünn, with the Fischereistrasse as the central longitudinal artery, a church erected at the side, with a square in front and behind at the end of the High Street, several other open and ornamental grounds, long blocks of buildings, and slightly raised streets.

In the north-western extension of the town of Königsberg the irregularly formed High Street, which is under provincial control, has a width of from 30 to 70 metres, and runs along the old fortification moat, thus providing the best possible building ground for the blocks of houses. The other streets are partly curved and partly rectilinear, according to the requirements of the buildings. The old tower (the Wrangelturm), surrounded by water, has been retained. Suitable building sites have been proposed for the church and two public buildings.

The new station quarter at Landshut has a slightly curved High Street of varying width, and with buildings.

A new quarter in Berlin provides for streets of a minimum width of 22 metres, with five-storeyed buildings of an authorised height of 22 metres. The High Street has a slight curve and a considerable widening in the centre of its length, where it is convexedly drawn. The other streets are curved or straight, according to the local requirements. A small park has been planned out, with a lake, in which the image of the choir of the church is reflected.

Two new suburbs of Posen and Neustrelitz have also been built, straight lines having been abandoned for curves. The suburbs of Posen adjoin a central park with flowing water and ornamental ponds. The Neustrelitzer suburbs are built round a natural lake, the banks of which are mostly surrounded by public promenades, and also, to a smaller extent, by building sites which extend to the water. On the southern side a new quarter, reserved for closed buildings, establishes the connection with the station of Neustrelitz.

In Dr. Stuebben's scheme for the reconstruction of the old town of Louvain, in Belgium, the quarter it is intended to transform includes the old slaughter-house and a large number of old dwelling-houses, which have hitherto been occupied by small tradesmen and artisans connected with the slaughter-house. Most of these buildings are in a most dilapidated and insanitary condition. The municipal authorities have decided to restore this old quarter, and at the same time to clear to a certain extent the approaches to the St. Pierre Cathedral. A new "Place du Parvis" will be constructed opposite the church, surrounded by buildings with arcades of a Louvain style. The scheme has been drawn so as to save the old gabled houses that possess any artistic interest.

Another project of Dr. Stuebben's is for a new town, called St. Anne, to be constructed on the banks of the Schelde opposite Antwerp. The scheme includes an industrial quarter adjoining the railway and the harbour, a park on a piece of ground torn up to a depth of 11 metres by the bursting of a dam, and, finally, the future centre of the new town. The Gand Road, pointing straight to the spire of the Antwerp Cathedral and the Avenue de la Gare, 800 metres from the Schelde, form two main and straight lines in the new city. Two underground tunnels below the Schelde, both above and below, are to connect the new town with the metropolis on the other side of the river. These tunnels are furnished with lifts for vehicles and pedestrians, and are connected with the station by underground tramways. Between the Avenue de la Gare and the lift of the higher tunnel a district for small shops, with unsymmetrical streets, a church, and an open space, will be provided. It is proposed to preserve, between the Avenue de la Gare and the Gand Road, a portion of the old village and of the old Fort de la Tête de Flandre, which will be transformed into recreation grounds. North of the Gand Road workmen's dwellings and houses for the middle class and shops will be built round the central square, where the town hall is to be erected. Exactly opposite the Antwerp Cathedral an ornamental square, with belvedere, has been included in the scheme, and round it will be built a theatre,

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a casino, and other public buildings. From this monumental square a street with arcades will lead to the principal church, which stands behind some grounds with plantations. The northern part of the new town, facing the industrial quarter referred to, is intended for the upper classes, and will consist of villas and private mansions. The centre of the new town, as above described, would be enclosed by a ring of from 40 to 60 metres, for an underground tram-line. The suburban districts would be constructed afterwards according to requirements.

Some modern schemes elaborated by other German architects, and illustrated by Dr. Stuebben, were the Colony of Hellerau, near Dresden, drawn by Riemerschmied, of which a model was shown at the Royal Academy; a garden city near Nürnberg, by the same architect, containing an imposing central square for the erection of public and other important buildings; the charming artisans' settlement of Merck, near Darmstadt, planned out by Putzer, where the High Street shows very fine irregular outlines, and consequently many beautiful street views.

The plan of the "Herdweg" quarter, in Darmstadt, is also the work of Putzer; two new quarters of the town of Essen, planned out by Schmidt, the artisans' colony, "Gottfried Wilhelm," and a residential district, by Holsterhausen. A bridge leads thence across the valley to the settlement known as the "Margarete Krupp-Stiftung for Convalescents"; the quarter "am Bernewaldchen," also in Essen. These, by architects Schmidt and Metzendorff, are amongst the best productions in recent German town planning; the new "Lietzensee" quarter of Charlottenburg, near Berlin. The lake is partly surrounded by gardens and promenades open all round, and partly surrounded by dwelling-houses with several storeys, which occupy a splendid position and overlook lovely scenery.

The Greater Berlin Competition.

A paper on the above was read by Professor Dr. Rud. Eberstadt. The claim on universal attention for town planning might be said to rest on the Holy Bible. In the story of Cain and Abel we are told that Cain went away and built a city. From that time begins the development of human society. We are being reminded of the old story every time we look at the cities that have been allowed to reach their present disgraceful condition, for do we not hear a voice asking, "Cain, where is thy brother Abel?" The Town Planning Conference was the best answer as to their determination to live up to their responsibilities. The task of town building is an international one, in which every nation can both learn and instruct. Lately the eyes of English reformers had been turned to Germany, and numbers had travelled there to study town planning and town building. Germany had reason to be proud of this attention from her masters. Nevertheless there exists a certain drawback to the honour. The English visitors generally went straight to the municipal authorities, who receive them with bounteous hospitality and drive them around the streets. The English visitor becomes filled with admiration for this street planning—not town planning. Consequently when those Germans who in the face of enormous difficulties are aiming at the individual cottage and house argue with the authorities against the existing tenement system they are told that the English visitors could not find words enough to praise that system. The admiration for the tenement system, asserted Professor Eberstadt, came too late, for that system's day was over. As they in Berlin got a belated French play from Paris or a scarf from London which is already out of fashion, so the English admiration for German street planning came at the very moment when they wished to get rid of it.

The problems existing in Berlin were given as:—(1) Congestion of street traffic, mainly in the central part; (2) as to the means of transport from the centre outwards; (3) the distribution of open spaces; (4) the artistic development and planning of public and communal buildings; and (5) the system of town extension. The starting-point of the German mistakes is that of street planning rather than town planning. Now, however, this idea is being done away with.

The rule ought to be that the worse the system of planning the easier to upset it. But in our time private interest is especially strong; and in nothing is it more difficult to overthrow than in housing matters. In London 150 years ago there was laid down a principle which seemed sheer revolution. It was then contended that private gain is public profit, private gain and public interest being identical. Sometimes in our day these two are opposed. But the old truth must not be lost sight of, for private interest and public benefit must again become identical in the greatest task of modern civilisation—the building and planning of our towns.

Professor Eberstadt concluded with slides showing some of the drawings submitted in the competition for a building plan for Greater Berlin. Twenty-seven sets of drawings were sent in. Two first prizes, instead of a first and second, were awarded, one to Hermann Jansen and the other to Josef Brix and Felix Genzmer. Views of the proposals were shown, as well as of the third prize design of Professor Eberstadt, Professor Mohring and Richard Petersen.

Thursday Afternoon.

The chair at Thursday afternoon's meeting in the Great Gallery was occupied by Sir Gilbert Parker, M.P.

The Chairman, in opening the proceedings, referred to the great success which the organisers of the Conference had achieved, and dwelt on the importance of the exchange of ideas, both internationally and amongst local authorities. He thought it was very necessary that those in the United Kingdom should know each other's views on those things which concerned the health and life of the people and the amenities of life. There was no provincialism in art and beauty, but they were the factors which harmonised divergent views and promoted standards and compelled people to adapt themselves to those standards.

Open Spaces, Gardens, and Recreation Grounds.

Mr. Basil Holmes, in an address on the above subject, said that town planning in its later aspects was so bound up with the provision of open spaces that it might be almost said to be the outcome of the open-space movement. Therefore it was interesting to know what had been done by the Footpaths and Commons Preservation Society and the Metropolitan Public Gardens Association, and to show what enormous work could be done by voluntary effort. The open-space movement first began to take shape in 1865, for obviously when the population of the country was comparatively small the necessity for open spaces was not so important. If they traced the origin of commons it opened up a most interesting chapter of domestic history, for the surviving common lands came down from the early Saxon times and were a relic of the system of collective ownership. As time went on commons began to be enclosed, until in the time of Queen Anne the sanction of Parliament was required to be obtained for further enclosures. Lands, however, continued to be enclosed until between 1860 and 1870 the open-spaces movement began to gather strength. It was found that these lands became less and less used for grazing and agricultural purposes, but that with the extension of towns they began to acquire a value for building purposes and the lords of the manors began to enclose them under the old Acts. It was for the purpose of resisting the enclosing of the commons that the Commons Preservation Society was started, and the beneficent results of its operations to the country could hardly be over-estimated. It was a singularly fortunate circumstance that, owing to the system of land tenure prevailing amongst their forefathers so much land was still left for the common use. The Commons and Footpaths Preservation Society had a happy hunting-ground ready to hand, and it did not fail to make the most of its opportunities by finding the ways and means to assert the rights of the community over the remaining common lands, which were in great danger of being enclosed, and they were successful in safeguarding a valuable heritage handed down from the past. But these common lands were not sufficient for the needs of the community, and much valuable work was done by the Kyrle Society, founded by Miss Octavia Hill, to get parks and recreation grounds. In 1883 the Metropolitan Public Gardens Association was launched by the Earl of Meath, who was still its President. At the time the deficiency of spaces for recreation was very marked and the Society found an interesting objective on which to devote its earlier energies—viz., the numerous disused burial-places, scores of which were to be found in London. Many of these places had been closed for a very long time and had begun to acquire a building value. One of the first successes scored by the Society was the passing of the Disused Burial Grounds Act of 1884, which prohibited throughout the kingdom the use, or the misuse, of these burial-places as building sites. Deprived of their value for such a purpose the Association was enabled to secure many of these areas and by means of voluntary contributions to lay them out as pleasant public gardens. Then they also found that in neighbourhoods which had once seen better days there were enclosed squares which were no longer kept up by the resi-

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dents, and the Association had in many cases converted them into gardens. They owed this circumstance to the good sense and foresight and public spirit of former generations of landowners, for the Westminster, Portman, and similar London estates were only the garden suburbs of the past. The Association urged the importance of securing all such areas, for there were 450 of them in London. They were not in a secure position, because when the leases of the adjoining houses ran out the squares would revert to the freeholders, who might use them. Indeed, several of them were in the market at the present time, and others had only been saved from the builders by being bought at enormous cost. The London County Council had paid over 10,000*l.* for a three-quarter acre square in East London, whilst 3,500*l.* was recently paid for a similar square in Southwark. He thought it ought not to be impossible to frame a scheme whereby all such places would not be allowed to be built over, but without altering the ownership, so that great compensation might be avoided. Then he would point out the fact that in London, where they had had streets with front gardens, the authorities had allowed them to be utilised for building one and two storey shops. They desired to see these features of wide roads and gardens introduced into town planning, and yet they allowed this building in streets where the features already existed. From a return he had obtained from fifty of the chief towns in the United Kingdom he found that in 1883 there was one acre of open space to 760 people, whereas in 1903, with an increase of 50 per cent. in the population, there was one acre of open space to 635 people. In London in 1883 there was one acre of public space to 950 people, whereas now, with an increase of 25 per cent. in the population, there was one acre of open space to 750 people. If a wider range were taken, so as to include such large areas as Epping Forest, Richmond Park, and Wimbledon Common, that figure would be sensibly reduced. The preservation of the amenities of districts was becoming a matter of great concern and they had many societies at work. At the present time the Metropolitan Association was engaged in the matters of the extension of Wimbledon and Putney Commons, the purchase of five or six acres known as the "Grange," Kilburn, the purchase of the Ironmongers' Almshouses, the extension of Streatham Common, the acquisition of Shadwell Market, the forming of open spaces and riverside walks along the river Wandle, and the preservation of the Crystal Palace and its magnificent grounds. The magnitude of the problem of town planning and open spaces became apparent when they considered that in Greater London they had a population of over 7,000,000 in an area of 699 square miles, which was equal to that of the Dominion of Canada with 3,700,000 square miles of territory.

Discussion.

Mr. H. M. Ellis said that he had that day introduced a deputation to the Surrey County Council with the object of inducing that body to assist in the extension of Wimbledon Common. They were also trying to save the last of the London rivers, the Wandle, which had several miles of beautiful stretches well worth preserving.

Mr. Horsfall spoke at some length on the question of physical deterioration and the need for systematic physical training of the children of the country. To enable this to be done open spaces were a necessity. They were all clamouring for more *Dreadnoughts*, but where were they going to get the men to man them.

Mr. Bernard Gibson said no greater happiness could be gained than in assisting in the work of the Metropolitan Public Gardens Association. He was glad to think that London was waking up in this matter, although the people at Hounslow had declined to buy Witton Park of 45 acres, which they could have obtained for 8,000*l.*

The Chairman expressed himself as delighted with the account of the work done by the Society, and said that in view of the fact that Shoreditch had only one acre of open space to 15,000 people, and Southwark one acre to 14,000, Mr. Holmes had not exaggerated when he said this was a problem of the greatest magnitude. It was a cheering sign to see so many municipalities represented at the Conference, for this was a question which would become as important to all the great towns as to London itself. They had attempted to deal with the problem in Germany and to some extent in a number of towns in this country, but the alleviation of national degeneracy would have to be faced with cash.

Colonel Eustace Balfour, F.R.I.B.A., should have read a paper on "The Town Planning Act and Open Spaces," but was unable to be present.

The Civic Survey.

Mr. F. C. Mears (Edinburgh) proceeded to show the slides prepared to illustrate Professor Geddes' paper on "The Civic Survey," which should have been read at a previous sitting. The slides dealt with the origin and development of the City of Edinburgh.

Mr. Ernest George presided at the meeting in the East Gallery on Thursday afternoon, when the following papers were read:—

Public Parks and Gardens: their Design and Equipment.

An illustrated paper on this subject was read by Mr. T. H. Mawson, Hon. A.R.I.B.A. He commenced by postulating that the civic park was not only a luxury, for it was also a necessity. In discussing past experience, Mr. Mawson contended that the chief mistake made by park committees of this country was their failure to recognise the claims of landscape architecture. Public parks, which contrast so unfavourably with private gardens, are almost entirely the work of inexperienced amateurs.

In this country we have overlooked the fact that parks and gardens should be planned in relation to their surroundings. Compare the orderly and natural arrangement of the parks and gardens of Paris with that of London or any English provincial town. In the former everything seems to fall into such orderly progression as to suggest that each park and garden occupies the only possible position for it.

The third cause of failure has resulted from the notion that landscape gardening was an art which aimed at concealing art. It was, and is still, supposed to be an art which seeks to reproduce Nature in her "gentler moods." Whatever may be said of the aims of landscape gardening, landscape architecture must be honestly inventive. It is essential that a clear knowledge should therefore be gained of the objective to be attained, the *motif* to be expressed, the local requirements. Here a knowledge of traditional design is needed.

A fourth cause of failure has been the introduction of all manner of cheap cast-iron erections, ranging from the silvered bandstand and the corrugated-iron grand stand to the automatic sweet machine. Cultured design is not possible with such accompaniments. Unless circumstances justify the employment of a capable designer, such features should be banned.

A fifth serious cause of failure results from the lack of practical knowledge relating to the planting of parks and gardens. The work is frequently deputed to the practical gardener who loves novelty, variety, and rarity for their own sake. The outcome is the huddled groups of sickly, half-starved arboricultural curiosities which so often do duty for park plantations. A public park is not the place for risks, and the capable man would prefer to work with six well-proved varieties rather than experiment with fifty doubtful ones.

Great Britain is rightly looked upon as the home of incomparably fine gardens. In the process of time, measured by hundreds of years, we have evolved a style, influenced let us add, in its evolution, by notable examples of gardens abroad? The English garden cannot as yet be reduced to the science of exact manner and proportion as is a classic façade; its charm is that it is so elastic as to be adaptable to almost any site or set of conditions, yet its perfect blend of art and nature always bears the marks of its nativity.

This English style may be formal or informal; architectural, or it may so far forget the canons of architecture as to run to wild Nature and help her, as Sedding put it, to "speak the truth." Its most perfect characteristic, indeed, will be found in its adaptation to its size, locality and environment, in its avoidance of engineering feats in the country, in a wise restraint and avoiding the landscapist's eccentricities in the civic centre. On the contrary, it would follow a logical and artistic progression by the preservation of every natural beauty in the former and by allowing Art to be supreme mistress in the latter. This is surely in harmony with the traditions of architecture, which, starting with the monumental expression of the civic centre, prefers rural simplicity in the suburb.

When we come to select illustrative examples of the English manner applied to public parks and gardens, we are met with the curious fact that we must go to the Continent.

In comparing the differences in planning English and Continental parks, it must be remembered that the conditions in this country are peculiarly local and national. Being a sporting and yet intensely economical people, we seldom lay out a park purely as an ornamental feature, but design it upon a revenue-producing basis. We want the maximum

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amount of recreation space, and, for preference, those which will contribute towards the annual upkeep. With us utility takes the first place and ornament the second, whereas on the Continent the order is reversed.

The second point of difference lies in the fact that whilst with us green lawns are the determining artistic factor, on the Continent it is shade trees and spinney woods. This fact should be kept strictly in mind when comparing ground plans apart from perspective views.

Anticipating the time when municipalities will think seriously about park design, let me say that our greatest opportunities will be found in the convenient planning and arrangement of recreation grounds and a fuller appreciation of our great heritage—beautiful lawns and trees—and when with true artistic insight we learn to grasp the significance of existing features and views, and acquire the skill perfectly to weave in the new with the old without discord.

To give point and meaning to the generalities, Mr. Mawson showed views of three attempts at park design:

A marine garden at Southport.

A small recreation ground at Cleethorpes, a seaside resort on the coast of Lincolnshire.

Pittencrieff Park, Dunfermline.

The latter was an ambitious scheme which showed the relation of parks and gardens to the design and plan of the town.

In September, 1903, Mr. Andrew Carnegie added to his many benefactions to his native town of Dunfermline by presenting half a million pounds, which ensures an income of 25,000*l.* per year. This gift was accompanied with the conveyance of this park and glen, which he desired should be devoted to the uses of a public park, reserving a portion of ground at the northern end for monumental buildings. This property is vested in a trust, who invited Professor Geddes and Mr. Mawson to prepare separate schemes for laying out the park and otherwise assisting them with suggestions. Unfortunately, every premise on which Mr. Mawson's scheme rested was considered by the trust to be impracticable, visionary, and unattainable.

Pittencrieff Park, through which runs a deep ravine, has hitherto effectually barred the expansion of the town on its western boundary. Mr. Mawson proposed to cut a fine boulevard right through the northern end of the park. His insistence on the value and necessity of this road led to the rejection of the scheme.

The group of monumental buildings included lecture hall, four towers, museum, large and small concert halls, art gallery, school of housewifery, bandstand, designed as a central feature to the colonnade, and a new super-arched bridge.

Every town and city has its neglected opportunities. The London parks are full of suggestion, and in many cases would entail a comparatively small expenditure to convert them into parks in which landscape architecture should reach its highest attainment.

Discussion.

Sir James Lemon, in opening a short discussion which followed immediately on Mr. Mawson's paper, expressed the opinion that the question should be approached from a practical standpoint; that was to say, they should first discover the means of acquiring land before thinking of the best way in which to lay it out. Public parks being a necessity it was to be hoped that under the Town Planning Act the authorities will acquire land for the purpose. The discussions at the other meetings seemed to be based on a pessimistic view of the Act. The speakers apparently expected that local authorities would not be likely to spend money on carrying it out properly. There was room for difference of opinion on that point. The public undeniably want something for their money; but if the ratepayers are shown that what is proposed is likely to benefit a town, then there is a very good chance of having it carried through. Mr. Mawson had shown on the screen a view of a suggested small recreation-ground at Cleethorpes, which is at present surrounded by a number of small villas. It was, thought Sir James Lemon, not unlikely that the owner of the land could be induced to give up a certain portion of it in the centre, or make a contribution towards the cost of purchase if it were impressed on him that it would be laid out as a park. There was no doubt that very much enhanced prices were obtainable for sites situated round an open space. This inducement should be a powerful aid in getting parks. If a high standard of public health was to be maintained it was necessary to increase the public spaces. In recent years much connected with public health had been rendered compulsory. The provision of open spaces was another step which should be made compulsory, ugly though that word might be in such a connection. The Town Planning Act was not created for the purpose of pulling down slums and acquiring existing buildings. To do that local authorities had previously ample powers. The Act had been framed on the principle that prevention was better than cure. However, once the open spaces had been acquired the next step was to lay them out properly. It was to be hoped that local authorities would entrust that task to experts; for the town surveyor could not be expected to know everything.

Mr. E. P. Warren spoke of the necessity for driving in the idea of an ideal if one was to be created. In London the public parks and gardens were rendered unnecessarily dreary and unattractive by the acceptance of a very low standard in the accessories. Compared with parks abroad the English park is laid out with scant consideration for what is around it; in the same way as we do not consider our railway-stations. Just as we seldom arrange the dignified approach to the station which is seen abroad, so we fail to properly arrange a park or garden.

The Architect and City Ornamentation.

We English, said Mr. E. A. Rickards, F.R.I.B.A., in an illustrated paper, have almost everything to learn in this department of civic art. By the ornamentation of the city is included all that may serve as amenities in any form to the life of the people. For example, the treatment of an oasis, a point of rest, in the labyrinth of the routes of modern traffic. Memorials of events, personalities, or purely abstract appeals to the intelligence or the soul of the town-dweller.

Even the display of flowers and plants, and the touch of almost feminine grace and holiday lightness they impart, come under the heading of architectural ornamentation when managed with such skill as the Viennese have shown in the succession of the graceful lamp-standards down the centre of the Ringstrasse, with the metal brackets, attached *à fleur de roses.*

London is without a public space or square, or even the smallest clearing, that is comparable to the average in any Continental town. Is there a public monument with any of the qualities of design which would justify its assertion of immutability and its claim as an uplifter of the more subtle side of our consciousness? and as for the other accessories of our streets, can they by any show of enthusiasm be quoted? Behind all our efforts there is a certain lack of style, a lack of confidence, which seems to be a mute acknowledgment of their insufficient character to support a derelict condition, instead of gracing positions allotted to them by design, and becoming, as it were, the high lights of some general scheme of harmonious design.

How, then, have we arrived at such a tangle, in which even the occasional work of the inspired artist is jostled by the trade advertisement (literal or figurative), or, worst still, is stifled in its effect by the necessary utilities of a benevolent but unenlightened municipality and the pathetic and obviously painful efforts of its servants to supply something of art in their making?

The answer is obvious—intelligent control, a jurisdiction that the smallest detail cannot evade, must be exercised, and this, so far, has never existed in any municipality in England.

Given an ideal field of operation, all the solid foundations of a town scheme with every possibility of artistic embellishment provided for, who is to be entrusted with the design and control of all these accessories to the dominating and enclosing general masses?

Naturally, one would think, those fitted by training and natural ability to do so; and it should be the duty of those in authority to seek out such special ability, and rise superior to the hitherto prevailing superstition that such details of ornamentation are without the province of the architectural artist. In the training of the French architect a complete study of all those details is included. Admitting that the artistic education of the English architect is far behind that of his French neighbour, the parallel is worth drawing, for his qualifications for assisting in the general furnishing of the streets are surely greater than those where training has been almost entirely confined to the studio and what can be executed by themselves in such a space. Yet at the present time there exists in England a privileged class who have almost an entire monopoly of the design of any street decoration, such as monuments, memorial fountains, &c., or, indeed, any decoration not an integral portion of a building, and this by virtue only of their eminence in an altogether different branch of art. Even in the rare in-

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stances of collaboration the architectural aid has been merely utilised in an attempt to render coherent an altogether inarticulate speech, if one can use the simile.

The architectural details of the English sculptor are individual at any cost, and seem designed to destroy any link with their environments. But he is not beyond impeachment even in far larger efforts than these when the opportunity affords. As an example of his attitude towards existing monuments we are shortly to witness the completion in London of a work of consummate art, whose author is long since dead. The full design is on record. The scale of the sculpture is most definitely indicated in the information he has left us, and is, moreover, in strict conformity to all classical precedent, as are all the details of this beautiful work. Yet, as this is a gift to the nation, the divergence from the original ideal is unnoticed or ignored, and the artist engaged on this work is beyond any jurisdiction, and substitutes (in all good faith, of course) his idea both in scale and treatment, which comparatively is Brobdingnagian. Another great monument of architectural art in this country has recently been happily saved from as serious a desecration, and even mutilation, by the protest of the architectural profession.

Many other instances could be quoted. Against this may be set the example offered in Paris within the last few years, when the idea of crowning the Arc de Triomphe with a quadriga was debated.

After the most careful consideration, it was decided that the monument was to retain its cold dignity, and was in no need of the embellishment.

The general movement and interest in the art of town arrangement and design has enlarged the horizon of the English architect, but it is to be hoped that it will quicken his nearer vision and perceptions, and give him the confidence to assert his interest in the design of much of the detail that is so necessary to make an artistic whole and his necessity to the community for such purposes.

With regard to the temporary decorations of the city, it will readily be conceded, that unless they are to obscure the design of permanent structures and arrangement they should be subservient to their lines, or at least respond to the anatomy of the figures they are to adorn. Though the light and perishable material might require the special knowledge and executive facility of the special craft of illumination or drapery or bunting, yet the architect, with his sense of balance and knowledge of the salient forms of the subject to be dressed, should be an invaluable and, in fact, the chief director.

Discussion.

Professor S. D. Adshead considered that the subjects of Mr. Mawson's and Mr. Rickards's papers were of especial interest, and, indeed, will be among the most valuable contributions to the Conference. It might perhaps be out of place for him to pass compliments or criticisms on the paper dealing with "Public Parks and Gardens," for he looked on Mr. T. H. Mawson as a colleague. The question of who is going to be responsible for a scheme of civic decoration could not be settled all at once. What now often happens is that the well-intentioned committee endeavour to obtain the best possible professional advice. But, declared Professor Adshead, there is no professional advice obtainable at the present moment. The architects, for instance, do not sufficiently study the surroundings of their buildings. It was to be hoped that the Conference would open their eyes as to the importance of considering every detail. Our schools should follow the lead of the French schools, who in their big schemes attach as much importance to the details as to the buildings. If English architects and architectural schools would consider schemes in such a way there would ultimately arise architects capable of handling city ornamentation in a broad manner. Mr. Rickards had rightly emphasised the lack of style and lack of confidence noticeable in monuments in this country. The sight of such a space as the Place de la Concorde, Paris, made one at once realise that everything had been designed with a perfect confidence and without any hesitation, whereas the opposite impression is made by English squares. Trees are, of course, the finest things possible, and one should be most careful of them. But to plant trees heterogeneously without consideration as to whether they will block out fine buildings is as bad as having no trees at all. The planting of trees to gain the best effect requires the highest ability.

(*Continued on page* 268.)

COMPETITION NEWS.

Gorleston-on-Sea.—At a meeting of the Governors of the East Anglian Institution for Blind and Deaf Children, held in Norwich on Monday, the 10th inst., the report of the assessor, Mr. H. P. Burke Downing, F.R.I.B.A., of 12 Little College Street, Westminster Abbey, upon the fifteen designs submitted by East Anglian architects in the competition for the erection of a school and homes at Gorleston-on-Sea was received. The assessor's award, which assigned the first place to No. 3 in the competition, was unanimously adopted by the governors, and the envelopes containing the names of the architects being thereupon opened, No. 3 proved to be Mr. John E. Burton, 57 London Street, Norwich. Mr. Burton was accordingly appointed the architect to carry out the work.

Upon the competition generally and the successful competitor's design the assessor reported as follows:—

"The conditions and instructions to competing architects, supplemented by answers given to certain questions put by the competitors, have made quite clear the requirements of the governors, and they may be congratulated upon the result of the competition. A great deal of thought and labour has been expended by all the competitors, and some quite admirable designs have been produced.

"The problem set to the competitors was not a simple one, especially in view of the number and variety of the buildings comprised in the whole scheme. The grouping and inter-relation of these buildings and their position on the site and aspects secured must constitute important factors in any decision upon the respective merits of the designs.

"Compliance with the regulations of authorities concerned, efficient drainage, economy of cubical contents and costs, and the provision for playing-fields are all among the matters which have had my careful consideration.

"I have carefully compared all the designs submitted, and I place first that numbered 3. The drawings present an extremely well-thought-out scheme. The plan is well arranged and is most economical; corridors are short and there is no wasted space; the buildings are well lighted and ventilated; the drainage is simple and efficient. The arrangement on the site secures to the full all advantages of aspect; the elevation is simple, suitable, and expressive.

"Rather more than half the site is left free for playing fields, which, moreover, are well situated to obtain the maximum amount of sunlight, and, for a considerable area, come under the shelter of the buildings from the north and north-east winds.

"The future enlargement of the institution would be simple. I have checked the cubing of the buildings as given by the author of the design and it is reliable.

"With regard to cost, I am of opinion, in view of the variety and extent of the accommodation to be provided, that the whole of the work will not be carried out with such satisfactory finishings, although of the simplest kind, as are properly required for buildings of this character within the limits laid down by the governors. This design is most economical in plan and treatment, and the author estimates the cost at 7,865*l*. The estimate is fairly made, but must, I think, be regarded as sanguine."

The designs placed second and third by the assessor proved to be those submitted by Messrs. Johns & Browne, Ipswich, and Messrs. Olley & Haward, Great Yarmouth, respectively.

ILLUSTRATIONS.

North British and Mercantile Insurance Company's Offices, Edinburgh.—The Staircase.

Amongst the excellent modern architecture that is to be found in Scotland the Edinburgh offices of the North British and Mercantile Insurance Co., designed by Mr. J. Dick Peddie, hold a worthy position.

Sketches by Mr. W. Eaton, A.R.I.B.A.

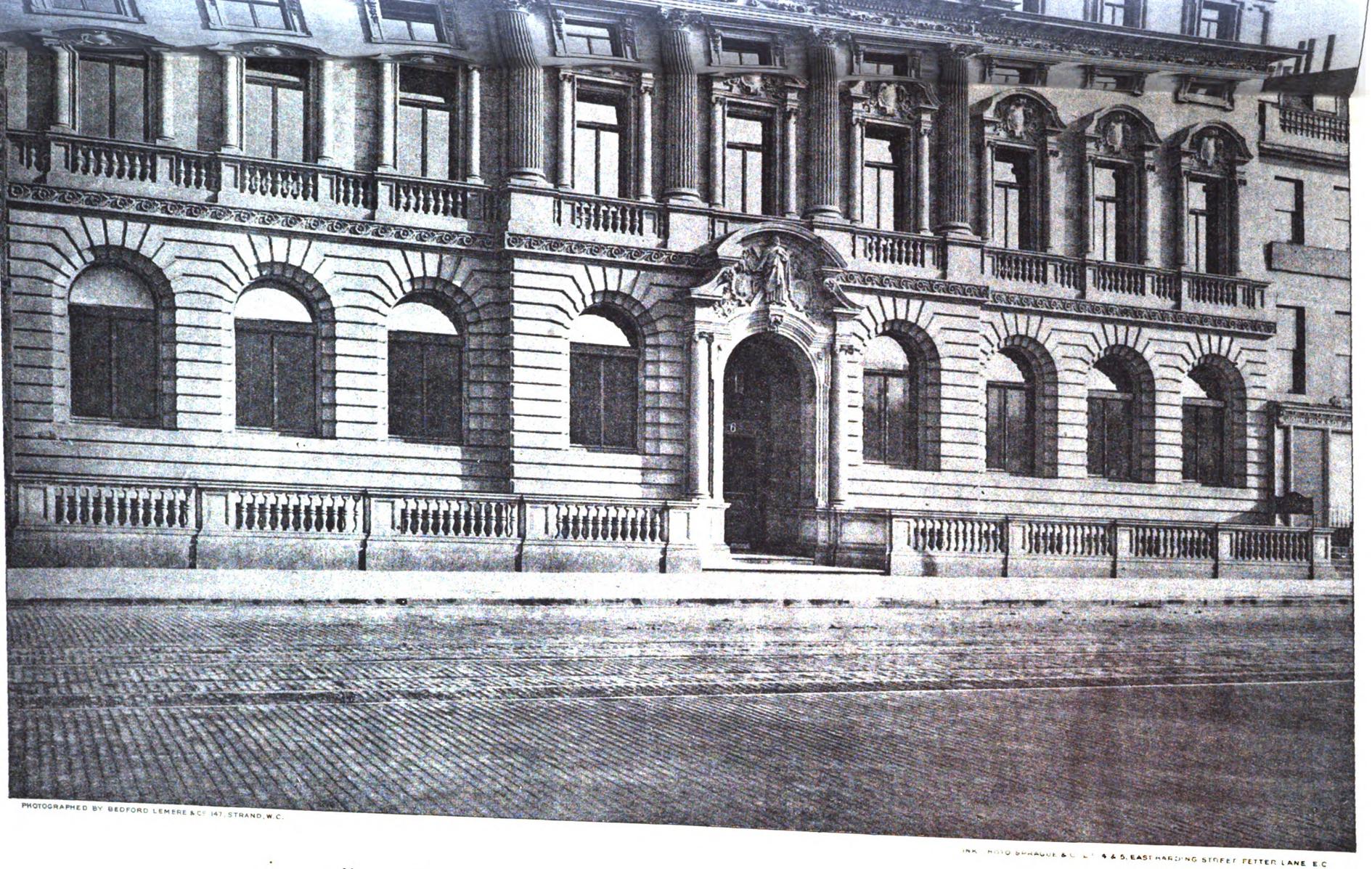
The sketches by Mr. W. Eaton, A.R.I.B.A., that we illustrate this week show typical examples of the church towers of Cheshire.

The Council of the Surveyors' Institution have awarded the gold medal for the best paper read during the session 1909-10 to Mr. W. R. Davidge, F.S.I., A.M.I.C.E., A.R.I.B.A., for his paper entitled "Town Planning Systems."

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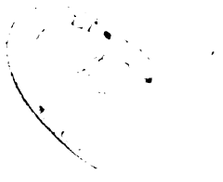
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NORTH BRITISH & MERCANTILE INSURANCE COMPANY'S OFFICES, EDINBURGH.

Mr. J. M. DICK PEDDIE, Architect.

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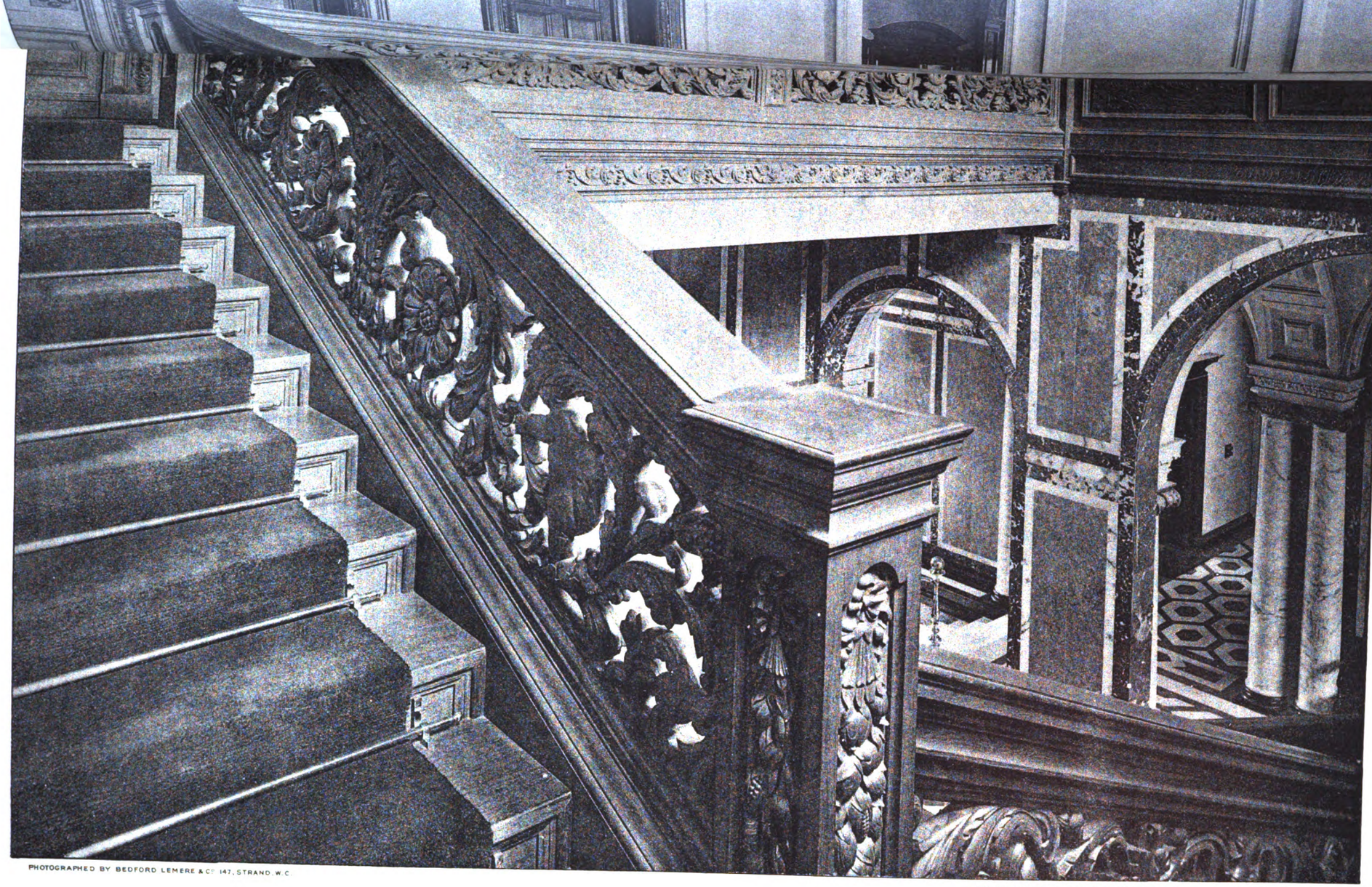


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NORTH BRITISH & MERCANTILE INSURANCE COMPANY'S OFFICES, EDINBURGH: THE STAIRCASE.

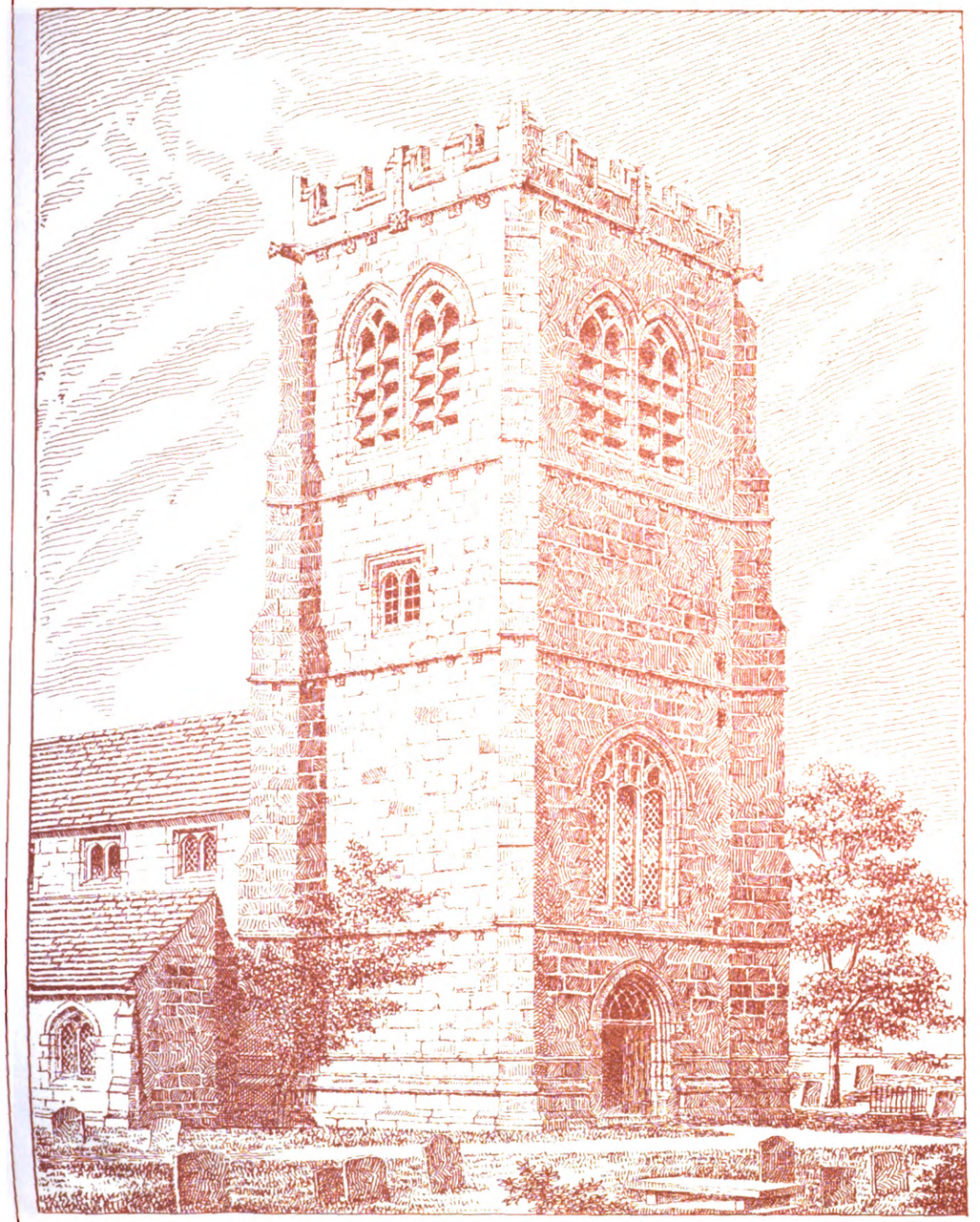
Mr. J. M. DICK PEDDIE, Architect.

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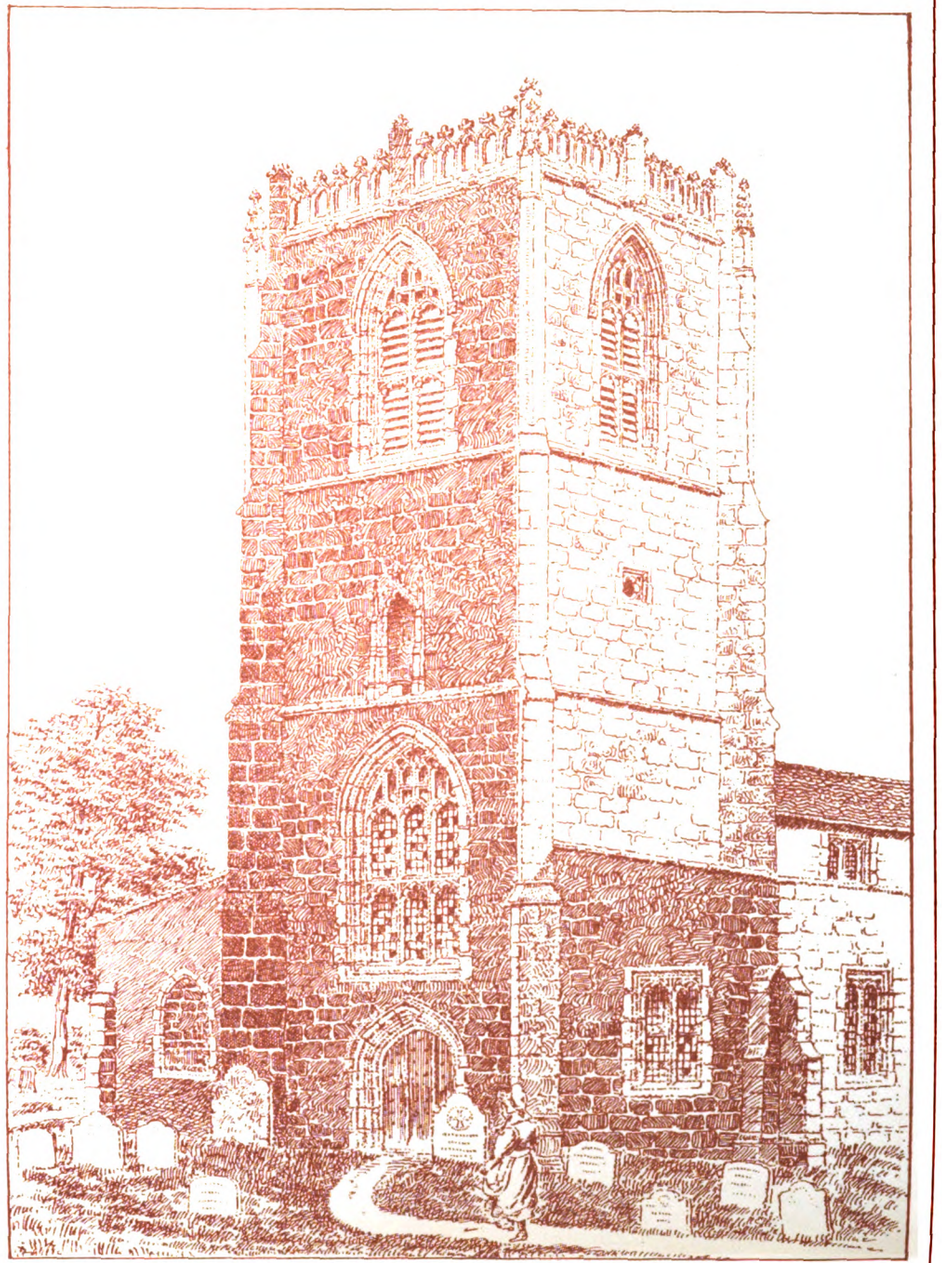


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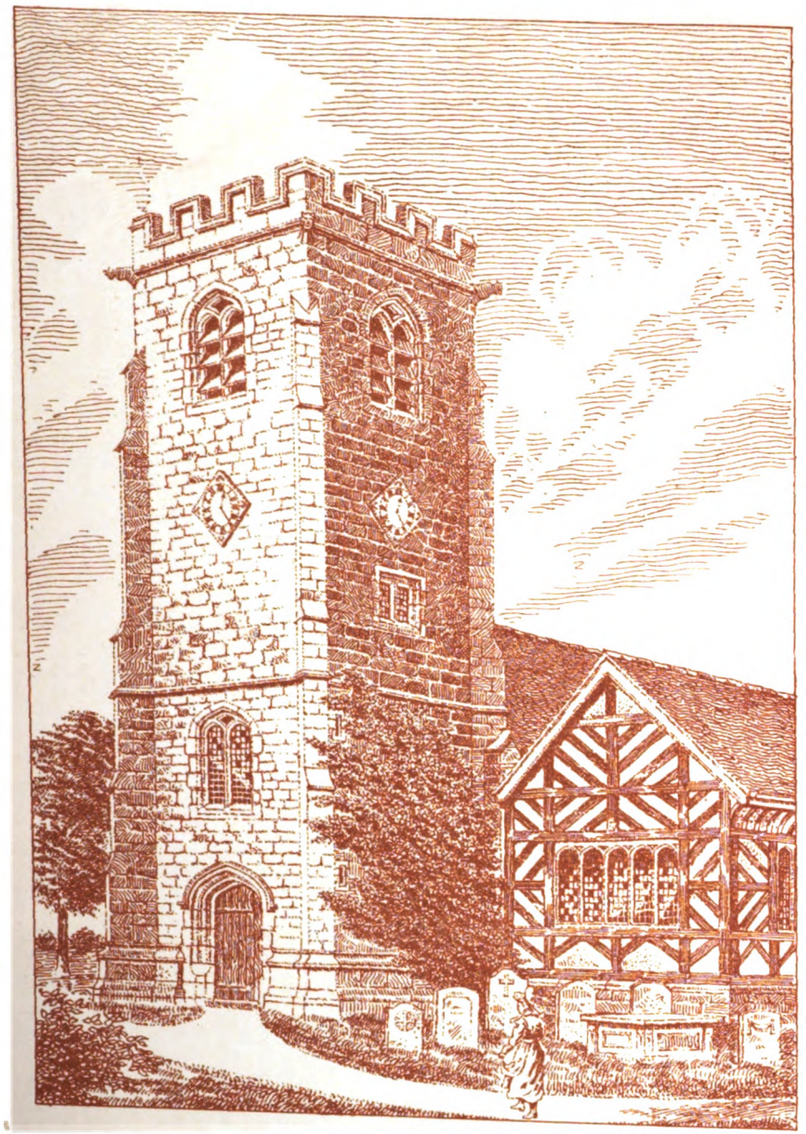


MOBBERLEY CHURCH, CHESHIRE.



HOLME CHURCH, YORKSHIRE.

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PEOVER CHURCH, CHESHIRE.

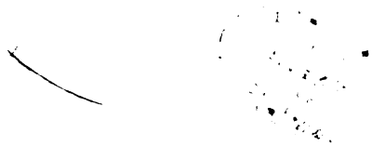


MIDDLETON CHURCH, LANCASHIRE.

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SKETCHES BY MR. W. EATON, A.R.I.B.A.

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THE ARCHITECTURAL ASSOCIATION.

The President's Address.

(Continued from last week.)

WHEN you have mastered such things, and so made them part of your equipment as to use the knowledge of them without conscious effort, then, and not till then, will you be able to make your art adapt itself to the new methods, materials, and requirements of progressive civilisation. But it is in this respect that you will enjoy greater advantages than the men of the generation before you: you will have greater ease and adaptability, more confidence in treading new paths, and more certainty of success in solving new problems. I could point to many cases where such adaptability has been shown, with distinguished success, although not as many as one could wish; but as an instance I might point to the great halls in the Bank of England, which always appeal to me as remarkable instances of the use of the dome and vault in a modern commercial building without any of the restraint that comes of mere copyism. But things of this kind are only to be done when your knowledge of architectural forms and features is well grounded and very comprehensive.

I do not suggest that all the study I have indicated is to be taken here in the two years' course of day-school training, or even in the further two of the evening school; it is study that is never to be put aside in the course of one's life: every day and place is the opportunity for it.

The Schools of the Royal Academy are open to those who have attained a fair degree of proficiency here, and are the proper place for the extension of the training begun here. Here the student is taught how to design, and with what materials he is to express his ideas and intentions. At the Academy he is given the opportunity of exercising his capacity under the guidance of those who have reached the highest position in their profession; of studying, if he wishes, the kindred art of sculpture; of association with men who are making their way to good positions as painters and sculptors; of hearing lectures by the most capable professors that can be found, and of competing for such prizes as are not to be won anywhere else in this country. But let me say emphatically that the Royal Academy is not in any sense an elementary school, and no greater mistake can be made than to go there too early; for it is quite possible for a man to gain admission there before he is sufficiently well grounded to hold his own or to derive any adequate benefit from the opportunities it affords.

One thing that might well be learnt here, and that I should like to see our students enthusiastic about, is really good drawing. We all regret that the architect can no longer live at his building and design it in bricks and stones, and with experimental lines and masses on the site. He has to do it on paper, and the better he can draw the more successfully, generally speaking, he will design. And, further, pictorial drawing is a valuable means of study, as showing the student how much the appearance of a building depends on broad effects of light and shade and colour.

For its own sake sheer power of draughtsmanship is something worth attaining. The personal pleasure of it! greater even than the pleasure of writing and speaking well; the control of things that it gives; its value as an attainment—always worth money, even if everything else should fail. I am not speaking of the mere quick and facile delineation of a building by lines on paper, but of something far beyond that: the power of conveying the impression of light and shadow, of the modelling of surfaces, the vitality and movement of animal forms, the subtle grace of leaves and stems and flowers. Not even the conventional school-of-art stippled and shaded studies, fine and perfect as they often are, but that which comes from free, forcible and broad, but withal subtle, sensitive and refined use of pencil, chalk, and colour. Studies from living models, drawings of ornament such as Alfred Stevens or Morris made, or of tracery and carving with the fidelity and grace of Ruskin's work. The kind of drawing that comes from the constant practice of literally every day; the habit of one's life. I am fully alive to the danger of good draughtsmanship in the hands of a bad designer. It is aptly illustrated by what Mr. Roosevelt said recently about the gift of oratory: that it was one of the foremost essentials to good citizenship, but that if it enabled the orator to persuade his hearers to put false values on things it merely made him a power for mischief. "Unless," he said, "the oratory does represent genuine conviction, based on good common-sense and able to be translated into efficient performance, then the better the oratory, the greater the damage to the public it deceives." The same thing is true of draughtsmanship, although the effects of it are not perhaps so serious; but in one respect good draughtsmanship presents a still greater danger, because it deceives the author himself as well as the public. I think, however, it is obvious that if a man is capable of conceiving a beautiful thing, he is at an enormous disadvantage if he is not able to express it on paper in any adequate way, and the difficulty and trouble of getting his intention realised in stone or metal will be greatly increased if he cannot show others, as well as imagine for himself, what he wants. It is one of the greatest aids to an architect in making him *efficient* and definite in his control of building work, just as the power of clear, incisive expression in words is to the lawyer.

This matter of efficiency is very important. A well-known authority on matters of economy and finance, recently returned from a long visit to America, told me that what impressed him most forcibly there was the extraordinary *efficiency* of everybody and everything; and he proceeded to discuss the effect of it in the enormous production of wealth and the increase of capital; but the same thing obtains through the whole of civilised life, from a teacher in a Board school to the President of the Board of Trade or the Bishop of London—the value of efficiency is beyond computation: the sound training which leads to an effective grasp of problems, to a power of administration and effective control, to the right use of knowledge and the power of acquiring and developing it, is the greatest asset wherewith a young man can be started in the world, the one thing that is to be depended on with confidence. Efficiency made the Japanese successful in their war, and made Darwin the prophet of modern science. An architect is judged by what he does, and not by what he might or could do under more favourable conditions; and this means that he must have the capacity for getting his own way and carrying things through to a successful issue. He must have authority, and speak with no uncertainty or diffidence, or he will create mistrust; but unless his authority is based on sound judgment and knowledge, the ultimate impression he will create will be worse than if he had hesitated about even the simplest matters of detail. And he must have sufficient tact to know when to accept guidance and when to take matters into his own hands and act on his own responsibility.

No one knows the troubles a successful architect has been through, but the great point is that *he* had the best of the battle, and not they.

The point I want to bring home to you in this connection is this: that for good or evil the whole trend of legislation and of public opinion nowadays is in the direction of more and more action by the State and the municipalities in matters that were formerly dealt with not at all by private enterprise. The effect being that things in which building is concerned are done, and will be done, on a large and ever-increasing scale: public and official buildings are wanted; official control is extended and will call for systematic and orderly procedure; public interest will be more and more drawn to the subject, and a more general appreciation and more intelligent attitude towards it will result, so that the need of capacity and efficiency such as will naturally be associated with a recognised school or system of architectural treatment must be more and more strongly felt, and in this way the value of good academic methods is going to be seen—methods which cannot fail to raise the average of capability, although they have always the danger of conducing to formalism and checking initiative. I confess to a good deal of reserve in advocating the departure from the older methods of training, because here in England our domestic and ecclesiastical architecture has reached a higher degree of excellence than elsewhere, and this quality has resulted from the pupilage system, combined with the ardent, enthusiastic, and even feverish study of old models, and admiration of the work of a few recognised leaders. Let us hope that both courses will continue to a sufficient extent to act and react on each other, and produce the kind of architecture that Inigo Jones's work is the best illustration of that I can suggest: buildings in which, with all their correctness and loyalty to precedent, the distinction lies in the freshness and the sense of elasticity and ease that are inseparable from art in its true sense, whatever direction it is used in. In fact, John Ruskin's Lamp of Life again—the personal force and imagination of the artist showing through the regularity and formalism of Classic design, just as it does through the seriousness of the constructive problems of the builders of the Gothic cathedrals.

We are no doubt living in a period of transition, for the intense flame of the Gothic revival has died down, but it

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can hardly be claimed yet that the Classic revival has taken its place. The present generation speaks lightly about Gothic work, and I was almost startled lately to hear an architect, whose name is well known, say that he did not feel that he understood Gothic, or know when it was good or bad! There is, no doubt, a good deal to be said in favour of the attitude of a man who is wholly on one side or the other, for nothing is so bad as uncertainty; but I venture to suggest that present-day Classic has to be a great deal better before it can afford to disparage the work of the Gothic revival. The intensity of conviction and singleness of purpose that characterised Street and Butterfield and Burges and many others are rare qualities to-day, and it is not easy to find Classic work as good of its kind as, say, the revived Gothic of Lincoln's Inn Buildings, or St. Agnes, Kennington. There is plenty of Classic work being built in solid stone that is not nearly as well designed as the stucco of Decimus Burton or Nash, and does not possess one-half of the appreciation of the principles of Classic that their work shows. The Gothic revival had advanced to a point when work quite different from anything that had been done before, but at the same time sound and full of interest, was being produced. It was original without being eccentric. But I think the Classic revival has far to go before it reaches a similar point. Much of its work is ingenious in its combinations and interesting enough in many ways, but I do not think that as Classic it is comparable with the Gothic of the Gothic revival. It has not the beauty of Inigo Jones's work or Webb's, the breadth and dignity of Barry's, or the inventiveness and capacity and refinement of Cockerell's. Much of it is eccentric and wilful, unmeaning in detail, feeble in skyline, and lacking in unity and cohesion.

I hope to see the Classic revival producing men who will rival the buildings of Elmes and Barry, teachers who will speak with the authority and conviction of Morris, sculptors with the resource and power of Alfred Stevens, and writers who will do for it what Sir Walter Scott did for the mediævalists.

I believe myself that the soundest basis from which to work is a thorough knowledge of Greek work. There is a quality of adaptability in it that gives an instinctive impression that the Greeks would have been better qualified to deal successfully with the problems of present-day methods, requirements, and materials than any who preceded or succeeded them.

The features of conventional Classic—the columns and entablatures, plinths and pediments, and other elements of it—are entirely out of scale with modern units of measurement, and the result is that all kinds of subterfuges are resorted to in order to secure the necessary dimensions without depriving buildings of light or convenience. This is found even in the work of such a master as Sir Christopher Wren, and at Greenwich Hospital there are to be found rooms lighted by tiny openings that are simply ridiculous and inadequate. I feel confident that the Greek artists would have met our conditions in a natural, unaffected manner, and with perfect success from the architectural standpoint, and it is in the study of the methods and attitude of the Greeks that our best hope for the future lies.

It has to be borne in mind that no revival is a revival and nothing else; the creative spirit never ceases. A revival merely means a new method of expression, and the student has got to regard himself as one who is in training as an artist, and not merely as a contriver of buildings in this manner or that.

Mr. T. G. Jackson, in a recent discussion of a paper on education, admitted that he believed in general culture as much as any man, but he pointed out that it would never make an artist, and he stated that a consideration of the careers of great artists showed that in most cases they had risen from the ranks. It is clear that while you can educate a genius you cannot produce one by education, and ultimately each student has to make his way and take the position that his inborn instincts and aspirations qualify him for. The leading benefits that result from good academic training are that it gives a broader view and a stronger grasp of things, and it gives great aptitude for study. Much time is lost by those possessed of little general education in consequence of lack of good methods, the want of skill in analysis and comparison, and the failure to appreciate what is required to be known. But, your schooling over, look to it that it is followed up and full use made of the opportunities that have been placed in your way. An Eastern poet said:—"Four things come not back to man or woman: the sped arrow, the spoken word, the past life, and the neglected opportunity."

Were this a pulpit my text would be the well-known words of the "Salutation of the Dawn":—"Look to *this* day, for it is Life, the very life of Life. In its brief course lie all the varieties and the realities of your existence: the bliss of growth, the glory of action, the splendour of beauty. For Yesterday is but a dream, and To-morrow is but a vision; but To-day well lived makes every yesterday a dream of happiness and every to-morrow a vision of hope. Look well, therefore, to this day."

No sounder advice could be given; for how many are the careers spoilt by looking to the future instead of acting in the present few of us realise.

Cultivate the critical faculty in your artistic training; without it knowledge or experience are of comparatively little value. Use it, however, to find out the merits of a thing rather than its failings or shortcomings. Coleridge said in one of his lectures that he never felt indebted to anyone who showed him the faults in a book. If beauties were pointed out to him he was infinitely obliged, but the faults were generally apparent enough, and in any case they did not interest him.

Thus, while it is well to know what should be avoided in design, how much better to realise what constitutes the character of a building instinctively felt to be a successful one. It is impossible to shut out the vicious and meretricious design that is seen in all directions, but it is safer to ignore than to criticise it; more is learnt by the critical examination of one good building than by the most ruthless analysis of a dozen bad ones.

The whole matter is serious and pressing, the work of the architect having such an intimate relation to the well-being of others. I am not speaking at the moment of his responsibility to his client—its seriousness is sufficiently apparent—but of the fact that the public will see his work and find inspiration and pleasure in it or the reverse. Well-constructed and properly arranged, well-lighted and warmed, his buildings must be; but this is but the beginning of his work. Architecture is something added to but beyond the constructive requirements; something that an artist is compelled by the nature of his being to supplement his work with, just as a singer will invest mere recitative with something far beyond the narrative and notes, with warmth and emotion and the sense of rhythm; or a master of language will invest the simplest and most practical thing with a pleasure quite apart from the import of the words.

Happy the student of art for its own sake! Our profession has few rewards to offer, even to the successful man of mature age, compared with other callings, but the active pleasure of the practice of it is a satisfaction that may balance a good many drawbacks and may encourage all its students to the hard work and close application that are necessary if any distinction is to be won.

I must not close these remarks without some reference to the general work of the Association. The King has extended his patronage to us, and it must be our care that we continue to be worthy of such an honour.

In amending our by-laws we have introduced a rule under which men of note who are not architects may join our Association, and I have little doubt that we shall find benefit from this arrangement.

We have again to acknowledge with gratitude the help given to us by the Royal Institute of British Architects in the matter of our finances. The relations between the Institute and ourselves are of the most cordial kind, and we value very much the help we get from it and from its individual members, and the privilege of illustrating the Institute prize drawings in our sketch-book. The Royal Architectural Museum, of which we are the curators, benefits to the extent of twenty guineas a year from the Institute funds, and I always feel sorry that the museum is not more generally used. The collection is a most remarkable one, and yet the Secretary tells me that most of those who inspect it are Americans or foreigners.

While I believe strongly in the work of our schools, I always feel a deep sense of regret when one by one the older institutions here lose their support and have to be modified or abandoned because they are no longer wanted. "The old order changeth, yielding place to new," but there is very much of the old order here that is full of value and that ought to be conserved. The Association was founded for the mutual assistance of members in studying architecture and kindred arts. This mutual study has gone on for more than sixty years, and I am most anxious that the work of the day and evening schools, important as it is, should not drive out the older organisations as long as there is any value in them. Our annual excursion and week-end visits are a case in point;

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they are well supported, but it is mainly by a certain few who come regularly year by year and have learnt to appreciate them at their proper value. Indeed, there is one well-known member who has been to every one of our forty-one annual excursions! The week-end visit to Bath in July was a great success, and I felt for my own part that I had never spent two days to better advantage. One sees things under such favourable and pleasant conditions on these visits—so much that is good in a short time—one forms lasting friendships, and the stimulus of other people's ideas and opinions helps one's appreciation of good things; new lines of thought and study are suggested, and the visit never fails to give one the sense of having made a new start and of having found some new ideals.

The visits of the Camera and Sketch Club must be mentioned in this connection. The reports of them in the Journal, following the modest estimates of cost that are sent to members beforehand, show these excursions to be marvels of successful enterprise and of economical organisation. The Camera Club has been doing good work in every way; it has added very largely to our photographic collection; it helps the Journal with a great deal of good material, while there are very able papers read and discussions carried on at its meetings. It has recently joined forces with the Debating Society, and the combination ought to prove a very strong one.

The Life Class and the Water Colour Class should need very little recommending, but the latter has often shown signs of coming to an end. It is difficult to find any good reason for this, and it certainly is not for want of skill or enthusiasm on the part of the master of the class. The art of water-colour is a particularly suitable one to an architect, and most undoubtedly useful to him in his professional work, so that I hope there may be no further falling-off in this department.

(To be concluded.)

THE SOCIETY OF ARCHITECTS.

At the annual meeting, held on October 20, the annual report of the Council was presented, from which we extract the following paragraphs:—

Forty-three members, two honorary members, and forty-five students have been elected during the past twelve months, and after allowing for deaths, removals and resignations, the total membership stands at one thousand and thirty-two, an increase of thirty-two during the year.

The following gentlemen have honoured the Society by accepting honorary membership: Sir Edward Brabrook, President of the Society of Antiquaries, and Sir Wm. van Hulsteyn, Kt., M.L.A., of Johannesburg.

The policy of your Council on the question of registration was fully set out in your President's remarks at the annual dinner, and the question is one which they have had under consideration during the past year. The time has not been propitious for dealing with the matter in Parliament, but progress has been made in other directions, and your Council feel that the way is being gradually cleared in the direction of a more united profession on this very important question.

An official statement by your Council which was published in the *Journal* shows that they have no intention of departing from the policy which the Society has always pursued in regard to registration, and it may again be stated that any Registration Bill which may be promoted elsewhere cannot be successfully carried through without the assistance of the Society.

Members of the Society may be assured that their Council will most carefully watch their interests and take effectual steps to block any measure which will adversely affect them. Preparations are already in hand for an active propaganda in connection with the Society's Bill during the forthcoming Parliamentary Session, and the Bill is undergoing revision with a view to amendment where necessary.

The membership of the South African branch is increasing, and the branch is doing useful work, both for the Society and the profession generally in South Africa. Your Council desire to thank the members of the branch for their services which have been of the greatest value.

During the past session papers have been read and discussions held on the following subjects, the paper on "Garden Planning," by Miss Dunington, being the first occasion on which a woman lecturer has addressed the Society:—

November 11, 1909.—Presidential Address. By Mr. Geo. E. Bond, J.P.

December 9, 1909.—"Town Planning." By Mr. Raymond Unwin (member).

January 13, 1910.—"The Measurement of Illumination: Daylight and Artificial." By Mr. Percy J. Waldram, F.S.I.

February 10, 1910.—"Garden Planning in Relation to the House." By Miss Lorrie Dunington.

March 10, 1910.—"The Art of the Plasterer." By Mr. Geo. P. Bankart.

April 14, 1910.—"Steel Construction." By Mr. S. Bylander.

The Practice Committee have met thirteen times, and at their first meeting they elected Mr. Edwin J. Sadgrove, F.R.I.B.A., as Chairman.

Your Council have, on the recommendation of the Committee, taken steps during the past year to get the conditions of unsatisfactory competitions modified so as to be brought into line with the views of the Society and of the Royal Institute, and in this matter the two bodies are working together with a view to securing the co-operation of their members in avoiding competitions, the conditions of which are considered by the respective bodies to be unsatisfactory. Action was taken by your Council in several cases, by inviting members not to take part in such competitions, and by suggesting to the promoters the desirability of amending the conditions.

The Committee had their attention drawn to the R.I.B.A. Licentiate scheme by a number of members, who invited an official expression of opinion, and your Council expressed the view that it is undesirable that members of the Society of Architects should join the Royal Institute in any other capacity than that of a corporate member of that body (*i.e.* Fellow or Associate).

The attention of your Council was called to a case where it was alleged that a person was making use of the distinctive initials "M.S.A.," and wrongly representing himself to be a member of the Society. After taking counsel's opinion, your Council applied for an injunction, and the case came before Mr. Justice Joyce, who refused the application on the ground that an injunction would confer powers of too drastic a character on the Society.

As the principle involved affected not only the Society of Architects, but every other professional body similarly constituted, your Council decided to appeal. In the meantime some technical point raised after the trial rendered it necessary that the matter should again come before the judge before proceeding to appeal, and the case was set down in the list, but was not reached before the long vacation. It will come on again probably in October.

The General Purposes Committee has met three times, and at its first meeting appointed as Chairman, Mr. E. J. Partridge, F.S.I.

In their last report your Council were able to state that they had entered into an agreement for a lease of 28 Bedford Square, and that plans for adapting the premises had been prepared by the Society's Architect, Mr. Chas. FitzRoy Doll, F.R.I.B.A. Since then a contract has been entered into with Messrs. Dove Bros. for the alterations, which have been carried out under the supervision of the Society's architect.

Two members of your Council—Messrs. Percy B. Tubbs, F.R.I.B.A., vice-president, and Mr. Edwin J. Sadgrove, F.R.I.B.A.—were deputed to represent the Society as the building owner and to see the matter through. These gentlemen have devoted a very great deal of time and attention to the many details arising out of the contract, and your Council and the Society in general have every reason to be greatly indebted to them for the services which they have so freely rendered and which are not yet at an end.

The formal opening of the new premises will take place on Wednesday, November 16, when the President will hold a reception.

The Council of the Law Society has arranged for the delivery by Mr. E. J. Naldrett, barrister, of the Middle Temple, of a short course of public lectures on "The Law Affecting the Laying Out of a Building Estate." The lectures, four in number, will be delivered on Tuesdays and Thursdays, January 3, 5, 10, and 12, at 5.30 P.M., at the Society's Hall. Sir Homewood Crawford, City Solicitor, will take the chair at the first lecture, and on subsequent occasions the chair will be taken by the President of the Society (Mr. H. J. Johnson) and other members of Council. It is felt that the present is a suitable time for dealing with a subject specially interesting to solicitors and others engaged in the work of developing building estates. The lectures will deal both with Metropolitan and extra-Metropolitan conditions. All gentlemen interested in the subject will be welcome.

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THE TOWN PLANNING CONFERENCE.

(*Continued from page* 264.)

Open Spaces and Running Waters.

The importance, said Colonel G. T. Plunkett, C.B., R.E. retired, in a paper under the above title, of preserving open spaces as parks and playgrounds and as the lungs of modern cities, for the benefit of the people who are being more and more massed in our centres of industry and commerce, needs no advocacy. The general idea has hitherto been—and perhaps still is—to surround a compact city by a more or less regular ring of open space or spaces. This has in most cases arisen from the existence of walls and fortifications, with which cities were enclosed down to quite recent times.

In London there has been no such opportunity in modern times, but by the preservation of common lands, as at Hampstead, Wimbledon, Blackheath, and elsewhere; by the great extent of the Royal parks, which have for many years been freely open to the public; and by the preservation and acquisition of Epping Forest and many other tracts of wood, meadow, or heath land, purchased by the aid of public bodies and private benefactors, at varying distances from the closely built central area, a number of natural or artificial parks have been provided for Londoners.

While welcoming every such acquisition, it is not only desirable, but also practicable, to proceed on some more systematic lines in the future. It should never be forgotten that for the young children a recreation ground of any kind will be of little use unless it is within a short walk from their homes. No park or playground will be of much use to the poor if over about half a mile or, say, at the most a mile from their houses. It must also be remembered that for the boys and young men playing-fields for cricket and football are required.

Whatever is done as regards playgrounds, large or small, these cannot take the place of the open spaces, which are best described as public parks, where we can provide for the people of all ages and of all classes scenes of natural beauty, with their refining, civilising, and elevating influence.

We shall thus give to the town-bred children frequent opportunities not only of breathing the fresh air, but of refreshing their senses and their minds with the sights and sounds of the country as Nature made it. Important as this contact with Nature is for children, the refining and elevating influence is not for them only; people of all ages can alike enjoy the pleasure of what we call a country walk.

As by reason of the expense it is impossible to preserve near a great city many very large areas of open ground, the only way in which the desired stretches of natural scenery can be maintained is by the preservation of long and comparatively narrow strips of country, commencing near to the thickly inhabited centres and extending a considerable distance away from them. Such a strip of country, with an average width of perhaps only three, four, or five hundred yards, but two or three miles in length, would be far more valuable than an equal area in a square plot.

The most suitable localities in the neighbourhood of London for public parks consisting of long, narrow strips of country stretching outwards from the inhabited area seem to be along the rivers and brooks. This applies to many other places besides London, as the majority of towns are situated similarly in valleys and on the banks of rivers, and thus in providing public parks of a very attractive kind we should attain the equally important object of preserving as natural features of the landscape our running streams.

Londoners have lost many of the clear streams which, in some cases down to almost our own times, flowed through pleasant meadows to join the Thames; now they are covered in as sewers or, where any portions remain open, are generally enclosed by buildings and defiled with rubbish. There still remain streams flowing through the fields which are so rapidly being absorbed by the suburbs of London which may be readily reached by an electric train or tramcar. It is important to remember that such typical English scenery—the scenes, the sounds, and the scent of the wild flowers giving pleasure alike to young and old—when once acquired costs comparatively little to maintain, and that the small expense of preserving it will diminish in proportion as we educate the people to appreciate its attractions.

By keeping buildings at even a small distance from the banks of a stream the purity of its water may be preserved. A few islands, whether already existing or very easily made by short diversions of parts of the stream, will make the best possible sanctuaries for birds.

Then there is the great importance of preserving from buildings the ground around the sources of streams, unless they are far removed from habitations. By enclosing the source, if the course of the stream is also protected, the purity of the water will be preserved, and there will be a certain extent of grass land as a gathering-ground of the rainfall.

The land at the bottom of a valley along the course of a stream is not usually the best for building purposes. Better and healthier sites will generally be found at a higher level. Therefore, in the interests of public health as well as of economy, and in addition to the æsthetic reasons, it seems desirable to secure the lowest portions with the watercourses as public parks.

Great expense may be saved by considering schemes long before we are forced to take action, and by deciding beforehand what course is best to adopt. Perhaps the grandest scheme for a park in this country was the plan of Charles I. to convert into a great game preserve the whole country from Wimbledon to Hampton, with the Thames flowing for about four miles through it. The King's intentions were not approved of by the Parliament; in fact, his efforts to get rid of the few farmers constituted one of the acts of tyranny which cost him his life.

The four points to be remembered are:—Firstly, that for an open space a long, if narrow, strip stretching away into the country possesses peculiar advantages; secondly, that the value of such a strip is immeasurably increased if it includes a running stream; thirdly, that in any case it is very important to preserve the rivers and brooks in the neighbourhood of our cities; and, lastly, that we should consider in good time the needs not only of the present, but of coming generations.

Discussion.

Mr. J. G. Jenkin contended that those who were responsible for the laying out of cities could not pay too much attention to the preservation of nature. For public gardens in the provinces the lay-out of nature was the best. However beautiful the Tuileries might be in its present position they would be a monstrosity at the seaside. The best and cheapest way of obtaining open spaces under the Town Planning Act is to schedule the land standing on each side of the brooks. In some cases the owners might give the strips for nothing.

Mr. Herbert Ellis made an appeal for the River Wandle, which is now under the category of a sewer, although as beautiful for its size as anyone could hope to see. Ruskin complained thirty years ago that its life blood was being drawn from it. There is now a strong movement to save it. It seemed to be imperative that a new spirit should be breathed into owners as regards their attitude towards the provision of open spaces.

Mr. Ernest George, A.R.A., in closing the discussion from the chair, said it seemed to him that the argument of both Mr. Mawson and Mr. Rickards had been that wisdom was needed at the inception of various schemes whether they were concerned with the lay-out of a park or the placing of a statue. There certainly has been no time in which we have possessed finer sculptors than now. There exists the ability, but it is unfortunately so often misplaced. It was to be hoped that the scheme for the preservation of the Wandle would be successful.

A vote of thanks was proposed to Mr. Ernest George by Mr. Mawson.

Friday, October 14.

The papers of Friday morning dealt with the general subject of "Cities of the Future." Professor Beresford Pite was the chairman in the Great Gallery, and Mr. J. A. Brodie, city engineer of Liverpool, in the East Gallery.

The City of the Future.—The Immediate Future in England.

Professor C. H. Reilly, M.A.Cantab., F.R.I.B.A., in discussing the city of the future, said that to us, as practising architects, it is the city of the immediate future that is our concern, the character of the growth during the next fifty years, and whether our art will be able to absorb that character and express it in beautiful forms.

Education has now had time to bring about, if not a better, at any rate a new standard of taste, and the futility of disorganised individual effort has at last been clearly realised. In Germany, apart altogether from any questions of art, the value of organisation in building development has been understood and practised for several decades. We are ourselves only just beginning to see that for the benevolent despotism of the great landlords, which till the middle of the nineteenth century was fairly successful, we must substitute an organised democracy if we are to have anything but chaos. The *laissez faire* period of town growth corresponding to the

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last half of the last century has proved its wastefulness as well as its hideousness; hence our town planning Bills and our co-operative suburbs. The note of the new period therefore is organisation, the suppression of rampant individualism for certain general amenities. And if the amenities at present most shrilly called for are greater air and greater garden space, it does not follow that they will stop there. Further refinement in building, quieter exteriors which will better compose with the general schemes, more simply shaped and better proportioned rooms which will permit of more refined furnishings, are but the next step in the same direction.

If suppression of individual idiosyncrasies for the general good may be taken as the key-note of our new garden suburbs, and I think there is not much doubt about it, do the houses which are already being built in them properly express this idea? While admitting very readily that they are a long way ahead of the surrounding villadom, is it entirely appropriate that they should in the main be based upon the early mediæval type of cottage, with high-pitched roof and gables, with wood mullion windows (stone being, I suppose, too expensive), rather than on the later Georgian types, with flatter roofs and sash windows, which are found so sedately set round many an English village green, and so largely contributing to its sober, restful character? On practical grounds alone one would have thought that the greater window space, the square ceiled rooms clear from the roof, would have been more satisfactory, while the simpler shapes would have allowed for a higher standard of interior proportion and detail. To further the supposed ideal of the home we have indulged in a rough and affected simplicity of finish, making use of such archaic things as solid oak steps in our staircases and bare bricks or tiles in our fireplaces. So far this striving after simplicity, this exaltation of the primitive cottage, is an affectation.

If, then, the house of the future suburb is on the one hand to express something of the new submission of the individual to the community, and on the other hand to answer to a more exacting and refined, if less sentimental, taste, it is obvious some new departure must be made. The question of evolving a new type of small house answering to these requirements is, indeed, the most pressing architectural problem in the city of the immediate future. The country house brought into the town is really as affected and stupid as the town house taken into the country. We want in our garden suburbs something between, expressing their peculiar character, a combination of the refinement of the town with the charm and quiet homeliness of the English country. I fancy in our desire for more reticent exteriors we should revert to flatter roofs with fewer gables, and seek our interest in such delicacies as trellis porches and verandahs, and windows carefully divided with thinner bars and marginal lights pointing to a higher standard of interior finish. Expression is most naturally given to such a house by a large swept-out cornice, adding interest and shadow to what otherwise might seem a bald reserve. It is our duty as architects to see that the æsthetic amenities—if one may use the phrase—in our new suburbs are at least on the level with those of hygiene, air, and rent, which are making so great a success of the new movement.

And if this applies to the buildings it applies with redoubled force to any new planning or adjusting of old lines. Here the classic idea of balance and axial vistas, derived from the Roman fora and thermæ, is universal. Paris may show the finest example of it, but for the monumental effects of the central portions of all towns it is the only formative idea. The simple elements of such planning, converging lines to centres of interest, symmetrical places of simple rectangular, elliptical or circular shape, quadrant roads, lend themselves with perfect ease to the maximum of convenience if the conditions of the problem have at the outset been thoroughly grasped.

The Cities of the Future.

Mons. E. Henard, architect of the City of Paris, read an inspiriting paper in which, with the help of lantern slides, he endeavoured to seek and picture the new structure which will be given to streets and houses. He said there will always be in every large urban agglomeration, whatever its future expansion may be, a centre of intense activity, where buildings must necessarily continue to be very near one another, as in our cities at the present day. It is a portion of such a centre which I am going to examine.

The modern house is furnished with lifts, water, gas, electricity, telephones, bathrooms, and drains on the *tout à l'égoût* principle, but at the same time we also find in it a very odd kind of fireplace, which discharges upon the town volumes of smoke injurious to health. The removal of ashes and refuse is carried out in a most barbarous fashion by means of filthy bins, deposited every night along the pavements for removal with dustcarts the next morning. As to the actual cleaning of the dwellings, it is of a still more rudimentary character. The process consists in first opening the windows, sweeping the floors, and then beating and shaking the carpets outside the window, when all the dust, with its multifarious germs, is liberally scattered in the atmosphere inhaled by the passers-by. M. Hénard then indicated the multiplicity of supplies that are, or may be, expected to be features of the city of the future. Sewers, mains for pure water and river water, tubes for pneumatic telegrams, pipes for compressed air, and the skein, getting daily more and more important and complicated, of telegraph and telephone wires, cables for the supply of electric light, the gas mains, a system of pneumatic pipes for vacuum cleaning, larger pneumatic tubes for the conveyance of letters, a network of pipes for the supply of liquid air for refrigeration, petrol supplied through pipes, thus conveying everywhere a clean and more convenient fuel, and other special mains for the distribution of sea-water and pure air.

M. Hénard's anticipation for the purposes of these numerous services was a street of several stories. In the first place the pavement and the carriage-way would be constructed once for all like a bridge roadway, and ought never to require any manipulations beyond those necessitated by the upkeep and repairs.

Immediately below the bridge roadway would be suspended the whole system of pipes required for the purposes enumerated—viz., vacuum cleaning, supply of compressed air, river water, sterilised pure water, petrol and liquid air, conveyance of letters, supply of pure air, &c., and then all the systems of electric cables (telegraph, telephone, light, energy, high-frequency currents, &c.).

Underneath said systems, which would all be easily accessible and controllable, a space of 25 metres in height would be left, absolutely open up to the old ground level. Four railway lines would then be laid, one metre apart, upon which would run trains of small trucks to remove all rubbish and refuse, as and when required, to convey all heavy and cumbersome materials, and to clear the rubbish from building or repairing yards.

The two central lines would serve for long distance transports, whilst the two lateral lines would be used for light trains; they would be connected by turning platforms with the private lines leading into each house. Each opening through which the trucks would enter the cellars would be closed by two independent doors or iron gratings in such manner that any communication between the house and the street would be impossible without the simultaneous permission of both the owner's agent and the representative of the administrative authorities.

This underground street would be permanently lit by incandescent lamps and glass plates on a level with the pavement. The natural ventilation promoted by electric fans would be produced by high chimneys located at given intervals through the party-walls between the houses.

Below the natural level of the street would be laid, as it is now, the sewer, but its dimensions could be reduced, inasmuch as it would be exclusively used for the evacuation of the water, and sewers with natural declivity could perhaps be replaced by watertight large mains to receive the waste water, which would either be forced out or sucked up independently of the level of the ground.

Finally, in the centre of the street a large fireproof main would be laid underneath for taking up the smoke, assuming that the old-fashioned method of heating with wood or coal were still in use in a few houses, although it is to be hoped that smoke-producing chimneys will then be prohibited and replaced by oxygen stoves, permitting complete combustion.

To sum up, this arrangement amounts to unfolding the modern street into two streets: one above in the open air, solely intended for the traffic of light vehicular and pedestrian traffic, and the other located below, on a level with the ground and underneath the former, which would take up all the pipe systems, remove the house refuse, and transport heavy materials and goods.

Supposing even that the requirements of new installations should require more room, or that the construction of a new line of transport should become necessary, it would be possible to dig deeper to obtain the space wanted under the points of support and to provide for any number of subterranean floors without ever hindering, congesting, or interfering with, the traffic of the upper roadway.

By generalising such a plan we are led to conceive a city possessed of streets with a very heavy traffic which would have three or four superimposed platforms, according to the requirements. The first platform would be for the pedestrians and vehicles, the second for the tramways, the third for the various mains and channels requisite for the removal of refuse, and the fourth for the transport of goods, &c.

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M. Hénard then went on to discuss the future form of house roofs, and suggested that they would be constructed as flat terraces; the most important result of which would be that these terraces at an early date will be used as landing-stages for aeroplanes. Aviators would be able to fly from one terrace to the other, starting and landing as they please. The natural consequence of this new state of things will be that each building will have to be furnished with big elevators, capable of raising the machines ready to start and to take them to their garage on their return. Lifts of this description would also be used to house motor-cars. The elevation of the courtyard which would result from the raising of the road would permit of all necessary garages being located underground.

We may divide the aeroplanes into two classes: light aeroplanes (aeroplanes of the "bee" type) and heavy aeroplanes (of the "bird" type, or dirigible balloons). The towns will probably have to be subdivided into three sections. The first, consisting of the nucleus of the centre of activity, would include the principal buildings, the historic monuments, the museums, the theatres, &c. Above that nucleus aviation of any description would be forbidden altogether.

The second section would consist of all the buildings or more modern dwelling-houses covered with terraces of sufficient resisting capacity to bear without injury the fall of light aeroplanes. Over this section aeroplanes of the "bee" type would alone be allowed to fly.

The third section, accessible to all machines, would be provided with landing-stages for large aeroplanes of the "bird" type and heavy machines.

It will soon be absolutely necessary for all large centres to erect as landmarks high towers or lofty spires of a very distinct shape and furnished at night with beacons at the top. The small towns could remain content with their old belfries, whilst cities of average size would have campaniles from 100 to 150 metres high. As to the great capitals like London, Paris, Berlin, or New York, we should no longer be satisfied with towers 300 metres high, but we should require structures rising to a height of at least 500 metres.

The necessity of erecting such lofty guide-marks opens up magnificent vistas as to the æsthetic capabilities of the large cities of the future. It will suggest wonderful ideas to our successors who will be called upon to construct towers of this description and to decorate them with sculptural, ceramic, and bronze or gold ornaments.

A City of the Future Under a Democratic Government.

Mr. Daniel H. Burnham, chairman of the Commission of Fine Arts, U.S.A., said he had specifically mentioned the form of Government because that factor had to be agreed upon before one can venture a prophecy regarding the action of a people. And he had chosen a democratic one because he was most familiar with it. The democracy of the United States was different from all preceding democracies. That it will persist would seem to be shown by numerous signs. Such a plenary democracy can realise any physical possibility which seems desirable to it; and when the majority of the people of any town come to think that convenience and its consequent beauty are essential, they will have them, for a democracy has full power over men, land, and goods, and it can always make its laws fit its purpose.

In a continuing democracy nothing will be done illegally, for a democracy cannot continue unless the people are intelligent, and real intelligence is, first of all, appreciation of law and order.

Following this train of thought: when the inhabitants perceive the value to the community of a fine street plan to bring convenience and beauty into the heart of a city, they can carry it out if they desire to do so. But will they so desire? There are good grounds for the belief that they will. The inception of great planning of public buildings and grounds in the United States was in the World's Fair in Chicago. The beauty of its arrangement and of its buildings made a profound impression, not merely upon the highly educated part of the community, but still more, perhaps, upon the masses, and this impression has been a lasting one. As a first result of the object-lesson, the Government took up the torch and proceeded to make a comprehensive plan for the future development of the capital. This action was less than ten years ago, up to which time there had never been a Plan Commission in the United States; but since then every considerable town in that country has gone into this study, and there are many hundreds of Plan Commissions at work at the present time throughout the land. A review of some of the organisations may help to determine the reality of purpose with which men have now gone into this work. The Washington Designing Board was appointed by the Government; the last President and, still more, the present one are at the back of it, and Congress has passed an Act establishing a National Fine Arts Commission as an outcome of their efforts.

Then came the plan of Manila, capital of the Philippines. Then came Cleveland, Ohio, which State passed a special law in order to allow large towns to employ expert commissioners, who are to design the public thoroughfares and parks, and who are to act as censors in all public art matters. Then came San Francisco, where an association of private men undertook to back the work. And then came Chicago, where the work was undertaken by the Commercial Club, which appointed a committee of fifteen of its members to conduct the enterprise.

It took a year to make the Washington suggestions, and about fifty thousand dollars of money. It took two years to make the San Francisco plans, and about twenty-five thousand dollars of money. It has already taken four years in Chicago, and about one hundred thousand dollars, and the work is by no means completed.

Other places have done the same earnest work and have shown the same liberal spirit as those mentioned above. But the most significant aspect of this new phase of life in the United States lies in the kind of men who are actively engaged. They are the best and strongest men of affairs. In Chicago in three years there were two hundred meetings of the General Committee, at which hundreds of public men—engineers, architects, sanitary, railroad, city transportation, and other experts—were present. There is not one man of the fifteen who is not at the head of some great business, and who is not loaded with the heaviest kind of responsibilities of his own; and yet they all make it a point of honour to be in their seats when the chairman calls to order, and not for a week or two or a month or two, but most faithfully through years; and it is everywhere the same.

There are many more instances, all going to show that the deep interest taken in the subject throughout the world marks not a passing fancy, but a definite step in the development of man; it means that humanity, which has been moved by the changeable feelings and fitful purposes of its own youthfulness, is about to put on the *toga virilis*.

Many different plans may be made for any given town, and each of them may be a good one; and we may rest assured that in a few years more every considerable town in the world will possess one. But, in addition to drawings and texts, we have left the most difficult task of all, namely, the awakening of public interest in favour of any comprehensive plan and the raising of public purpose up to a level of definite action.

Will not the people of a continuing democracy awaken some time to the fact that they can possess as a community what they cannot as individuals; and will they not then demand delightfulness as a part of life, and get it? The realisation of this will not be long coming, if one may judge from the growth of public improvement in the last few years. The men of 1850 knew much, but those of 1910 know enough more to make their work seem marvellous in contrast, and we may be sure that the men of 1960 will regard us as we do our predecessors. But it is not merely in the number of facts or sorts of knowledge that progress lies: it is still more in the geometric ratio of sophistication, in the geometric widening of the sphere of knowledge, which every year is taking in a larger percentage of people as time goes on. And remember that knowledge brings desire, and desire brings action. A mighty change having come about in fifty years, and our pace of development having immensely accelerated, our sons and grandsons are going to demand and get results that would stagger us. Remember that a noble logical diagram once recorded will never die; long after we are gone it will be a living thing, asserting itself with ever-growing insistency; and, above all, remember that the greatest and noblest that man can do is yet to come, and that this will ever be so, else is evolution a myth.

The City of the Future—Its Chances of Being.

Mr. L. Cope Cornford's paper was a protest against the subordination of the individual to the democracy. His view was that to the plain citizen there is an even more important point of view than the commercial aspect of the subject, in which man is considered as a social animal engaged in social activities—the point of view of the individual family. In what fashion soever he may worship the public deities, they are the gods of his own household for whom he reserves his essential adoration. Should the buildings consecrated to

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public worship offend him, he has one simple and effective remedy. He need not go to church. If he chance to dislike the proceedings of Parliament, he can ignore them. Does he entertain conscientious objections to the new educational methods, he can always console himself with the reflection that his son or his daughter will in all probability learn nothing in these establishments, whose very appearance they will hasten to forget.

But in order to maintain this admirable freedom of his soul he must have one thing. He must have a home of his own. A contemporary writer has somewhere very justly observed that what Mr. Smith really wants is a house to live in. That is all he asks, and that is precisely what is denied him. He may have churches, Parliaments, schools, museums, baths, workhouses, and the key of the street—and welcome. But a home of his own—no. By no means. Yet Mr. Smith is willing to pay for his house. Still it is denied him. He may, of course, set up his domestic gods within four walls and under a slate roof, in a place where trams moan past his window by day and night, and the air of heaven is darkened, and footsteps beat upon foul pavements for ever.

It was not always so. The past, which remains our instruction and our hope, displays in all the wistful silence of antiquity the Roman house of the many chambers and the flowered quadrangle, the Roman villa set among the vineyards and the corn, the discreet and peaceful mansion whereto the ladies and the gallants who dwell for ever in Ser Boccaccio's pages fled from the plague-struck city. In a later age, the town houses of France and of Germany, the castles and the hunting lodges, witness to a high and an urbane civilisation. In our own country we preserve what we believe to be the most beautiful houses, great and small, in the world. But the most of them are relics of a happier time.

In a word, what the plain citizen, the humble man of heart, hopes for in this Conference is that he may at last obtain his modest desire—a fit home in which he may worship his domestic gods in peace. And here—if I may venture to suggest it—lies the kernel of the matter. The State is made up of individuals. The unit is the family. When all that is implied in that sacred and immemorial cult be rightly and beautifully expressed in architecture the rest will follow. When Mr. Smith possesses in peace his own solid little home he will attend to the town hall.

What are the chances that he will ever get what he wants? In other words, what chance has the ideal city of coming into being?

The chance that the individual citizen may obtain his peaceful, solid little home depends entirely upon the measure in which Mr. Smith understands that architecture is an art, and that none save those who have dedicated their lives to her service can hope to achieve a good thing.

But the individual citizen must do his part. All the architects in the world cannot save him if he professes a religion in which he does not believe, a respect for law which he does not feel, a desire to get a learning which he really despises, an aspiration towards the possession of a beautiful home which is no more than the ambition to be a little more pretentious than his neighbour.

Discussion.

Sir Richard Paget, Bart., said he would like to say a word as to the importance of simplicity and economy in the architecture of the future. The consciousness of new needs for the body politic must produce many various effects, the first result being a competition between those needs. If architecture is to get its share it will only be by showing it can give full value for money, for economy is one of the most important elements to be reckoned with. The great monuments would have to be useful structures, also the buildings will owe little or nothing to extraneous ornament or waste of any kind. The sky-scrapers afford an important and valuable object lesson, for they represent the highest possible degree of concentration; and concentration is absolutely necessary in the centre of a town. Perhaps it would be possible to replace the present sky-scrapers by structures uniform in shape like great pillars, which would combine to make one stupendous temple of commerce in the city centre. Before such a building Karnac would pale into insignificance, for it would be four or five times as big, and far more useful. Hitherto our body politic has been a dowdy old object, over-developed in some parts and sadly arranged in others. We have now undertaken the necessary but extensive task of rejuvenating her. It was, therefore, time to plead for a new fashion in dressing the body politic, based on simplicity and fidelity to the form of the wearer. When all these first considerations had been attended to then they might adorn her with jewels.

Mr. Ebenezer Howard pleaded strongly for the individual home being the one unit to be considered in every town planning scheme, the home being the one thing essential. No city could ever be an ideal city unless it provides for all the people the essentials of adequate space and light and air. They were all proud of London in some ways. But not very long ago a great man said there was no thought of pride associated in his mind with London, for he was always haunted by the awfulness of London. The Conference would miss a great deal if those present went away from it without getting hold of one or two essential principles in the planning of towns. The greatest social phenomenon of the nineteenth century was the way in which the country population, mainly owing to economic causes, congregated in cities. The phenomenon of the twentieth century is going to be the reversal of that. Those economic and spiritual forces which urge men on in their affairs all point clearly that the time is coming when the populations will pour out of our cities. The problem right in front of us is how to build an ideal town on a relatively clean slate. When this has been done we shall know how to reconstruct our cities. All know that London is too large. What is needed is that a conscious effort should be made to reduce its population by a systematic method of town planning in new areas. The right lines are exemplified at Port Sunlight, and Bournville. At Letchworth an industrial town had been established, though it was prophesied by all the experts that they would not succeed. It was there demonstrated that it is possible to move out businesses. Letchworth is admittedly open to criticism. But that is because the British public would not come forward adequately to finance the scheme. However, they at Letchworth were nearly round the corner, and what has been done there will be imitated by all.

Mr. A. T. Taylor, R.C.A., L.C.C., said the great fair at Chicago was a revelation to the citizens of town planning, and of that project Mr. Daniel Burnham had been the moving factor. Anyone who had travelled first many years ago in the United States and again lately will recognise the immense improvements that can be effected by an intelligent democracy. Our own colonies beyond the seas being in process of formation, now is their time to formulate town plans so that they may begin where we have left off. The opportunity offered is one which no other country has ever had. This is the beginning of a new era, and 1910 will date as the commencement of an epoch in town planning and the beautification of our country. London is not, however, so bad as is sometimes made out. The London County Council were doing their best in the face of enormous difficulties such as no other city had ever had to face. The ratepayer, who was already overburdened, must be considered. Mr. Taylor concluded by saying that the County Council would be glad to consider any suggestions which might be made.

Mr. Francis Swales said he had been struck by the lack of harmony in the points of view shown in the Conference. Of course it was only the beginning of a new movement, and it had brought together a great many people of diverse views. There seemed to be a wrong impression abroad that the Town Planning Act will require every town both great and small to prepare a town plan more or less in imitation of that for a great city. It had only been discovered at the end of the Conference that architects are most potent in their arguments for economy.

Councillor Galbraith, Glasgow, remarked that a Scotsman was nothing if he was not practical. To his own mind the whole question resolved itself into this: Where was the money going to come from? When architects told them of the beautiful plans they could put upon paper he believed every word, but he wanted to know if they were going to convert the city of Glasgow to the costly ideas of some of those gentlemen. He had listened with interest and delight to Mr. John Burns speaking about a desire to see Cannon Street Station swept away and replaced by something else, but he did not say who would provide the money. They had already done a great deal in Glasgow to make it a delectable place to live in. He could show them, if not a clean city, a clean river, Glasgow having just completed within the last few months a great scheme which had cost nearly 2,500,000*l*. At this moment they were tackling the question of the atmosphere and the matter of cross-river communication. They were also trying to do away with slumdom; but to attack greater schemes and rebuild streets and that sort of thing was a matter about which the ratepayers would have something to say. They would hardly appreciate a rise of 6*d*. or 1*s*. or perhaps 2*s*. in the rates. That was the great difficulty in connection with town plan-

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ning schemes. He had come to London to hear something about where the money was to come from, but none of the delegates he had heard had tackled the question.

Professor S. D. Adshead pointed out that the country cottage was very ill-fitting in the town, and a town house was out of place in the country. The point was well worth bearing in mind by architects engaged in town planning in the suburbs. There was no time to enter into the question whether every type of country cottage has been originated, though speaking generally he would express the opinion that it had not. The architectural possibilities of the urban district had not yet been thoroughly investigated. There ought to be a new type created for it. They would have to deal with rows of cottages set out at about twenty to the acre. The type would have to be a simple one, without awkward corners, and so on. The new conditions being evolved in the United States show that the fusion of numerous nationalities can produce something original.

Mr. Gibbon expressed admiration for the schemes advanced by Monsieur Eugène Hénard in his paper on "Les Villes de l'Avenir." Public convenience would be greatly facilitated by the suggested street of several storeys. But the bird's-eye view which Monsieur Hénard had shown had filled him with wonder mixed with alarm. It had clearly shown that the same type of mind which was skilful in engineering projects might not be skilful in things of beauty. This truth should be borne in mind in connection with town planning. In some of the smaller towns there was a danger of leaving things in the hands of borough engineers. They were of course most admirable men in their way. But when delegates return to their councils they should call attention to the fact that beauty was a commercial asset, and that the best way to get beauty was to combine some outside help with the borough engineer.

Mr. J. A. Brodie, M.Inst.C.E., city engineer, Liverpool, as chairman of the overflow meeting, said that, although something like M. Hénard's suggestion might be possible and desirable in the centres of great cities, he should advocate the formation of wide roads suited for fast traffic to the outlying parts, and he thought that in cities of moderate size four-storied streets would not be required, but that wide roads would be preferable. He urged the high importance of the true economy of good work in the sound construction of roads.

Closing Address.

Professor Beresford Pite, F.R.I.B.A., brought the meeting to a close by a short formal address. The Royal Institute of British Architects, he said, brought the formal gatherings of this Town Planning Conference to their conclusion with the subject of "The Cities of the Future," and beyond which our mortal eyes do not see. To the architect belongs the primary conception of the ideal as well as the direction of its attainment.

The architect knows well that it is vain to expect imagination to conceive or design to begin without principles, purposes, or precedents—forgive the alliteration—and to the discussion and elucidation of these three factors in the art of the town plan, this Conference, with the indispensable assistance of the exhibition has been directed.

Amidst this variety, perplexing and increasing in complexity of regulation, what has this Conference found to be the key to the difficulty and the solvent of the trials of the new problem, town planning?

We have it in one word, architecture, and the architect reaping with keenness the abundant and yet ungarnered harvest of precedent—rich fields indeeed, as the walls of the Royal Academy at present evidence—is armed by precedent to lay down the principles by which alone the purposes of the present can be made effective both for to-day and to-morrow, for our generation and for history.

Principles of municipal life and polity were as potent and much more so in ancient Rome than in any modern community, and the conclusion must ensue that the survival of a pre-eminent architectural character and expression gives the keynote for the town planning movement in our own era. That the Middle Ages, with no organised craft of architecture as an art, have left such fascinating proofs of the charm and serviceableness of natural methods of building and design, again emphasises the fact that the enduring elements of town planning are architectural, and that in the study of buildings lie the seeds of fruitful beauty for street or city.

The individual genius of the men of the Renaissance becomes a nearer and more characteristic guide for us. Almost the only surviving impression of contact with a great Renaissance plan is that of architectural grandeur generated by devotion to a classic vision of the past applied to the purpose of extending and glorifying a city, a place, or a palace. The glory of a city is its grandeur, the gracious width of its avenues, the adjusted proportion of its squares, and accompanying the severeness of its healthy spaciousness and ordered amenities.

It is to such precedents that this Conference of architects directs attention for the education of the public conscience and the elevation of its patriotic ideal. Architects have committed to them the possibilities of the promotion or depression of the amenity and beauty of the aspect of the town.

This quality of an architectural charity which begins at home we commend most earnestly to all responsible authorities. In this relatively free country, laymen untrained and irresponsible to artistic criticism became the custodians of our civic heritages and the promoters of town development. To the mayors, the chairmen of municipal committees, to their permanent officials, surveyors and engineers, this institute appeals, in the higher interests of the community and our national repute, not to neglect the mother art of architecture, which, taking up the common purposes of building, dignifies the commonplace and renders the necessary gracious and pleasant; for the same art with like instinct and power can make the commonest and most local street improvement subserve a high purpose of improvement and beauty, if only it be considered as a subject worthy of the highest and best effort of those qualified by study, experience and grace to serve the art of its architecture.

The town is too precious a possibility, if not already a possession of beauty, to be entrusted to consideration only of its expert surveyors and engineers. The problems are architectural besides, and will be ultimately judged as such.

In furtherance of help in this important matter for all town authorities undertaking the preparation of schemes, the Royal Institute of British Architects extends its heartiest co-operation. Its Town Planning Committee at the inception of the recent legislation was constituted to consider and advise upon its progress. The Committee on Town Planning will continue its labours, and shortly issue, after the transactions of the Conference have been published, a report on the conclusions of the Conference adaptable to the present needs of authorities preparing town plans.

The material offered to the Conference by the amity of our *confrères* will be invaluable to this end. The exhibition of plans and designs has an educational force of great power. The new world is redressing the balance of the old, and the past is reproducing itself in the present. For the papers, for the exhibits, for the personal contributions to the discussions, and for that delightful spirit of universality in art sympathy which is one of the greatest common qualities which men share in spite of all other divisions of race, government, and temperament; for all these the Royal Institute of British Architects is profoundly and ardently thankful to the members. May our art yet flourish, and amidst the many conflicting streams of life continue to make for Peace, Health, and Joy!

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Waterproofing Buildings.

Sir,—I saw in your journal—I think it was about three or four months back—an article on the waterproofing of buildings. If I remember rightly, the material was supplied in a form of paste, to be mixed in with the cement. Might I trouble you for the name and address of the makers of the material in question?

Thanking you for your favour, I am, yours, &c.,

Country Builder.

[The material you inquire about is Ceresit, supplied by the British Ceresit Waterproofing Co., Ltd., 315 Caxton House, Westminster, S.W., and is one of several forms of waterproofing material described in the article in our issue of April 22, 1910.—Ed.]

The St. Andrews Provincial Committee for the Training of Teachers met at St. Andrews last week, and had under consideration matters relating to the erection of a training college in Dundee at an estimated cost of 60,000*l.*, and a site for which has been procured in Park Place. Sketch plans were submitted showing the accommodation for the various classes, and how it would be distributed. The sub-committee were authorised to have the sketch plans adjusted and forwarded to the Department for approval.

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The Architect.

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FORTHCOMING EVENTS.

Tuesday, November 1.

Institution of Civil Engineers : Presidential Address by Mr. Alexander Siemens, and presentation of medals and prizes.

Thursday, November 3.

University College, London : Second of a course of eight public lectures on English Domestic Work, by Mr. J. A. Gotch. (2) "The Later Mediæval Houses."

A.A. Camera, Sketch and Debate Club : Mr. Laurence Turner on "Plastering and Modelling, with Demonstrations."

Friday, November 5.

Institution of Civil Engineers : First of a course of five lectures on "Reinforced Concrete," by Mr. Wm. Dunn, as arranged by the University of London.

Monday, November 7.

Royal Institute of British Architects : President's Opening Address.

Liverpool Architectural Society : Mr. Felix Clay on "The Beginnings of Art."

THE CONFERENCE—AND AFTER.

THE Royal Institute of British Architects in general and the Secretary-General, Mr. JOHN W. SIMPSON, in particular are to be congratulated on the success that has attended the Town Planning Conference as regards its purpose and intention of arousing the British public to the value of town planning, architecturally treated, not only as increasing the beauty of the towns in which four-fifths of the population of England are now living, but as enhancing the amenities of life and improving the healthiness of environment.

By the Philistine these advantages are valued in the inverse order. The beauty of the town is to him very much a matter of indifference; if he can have it increased without expense, or with only a small expense, he is content to have it, but not otherwise. Of this we have an apt illustration in the reception given by the Court of Common Council of the City of London to the suggestion that the new St. Paul's bridge should debouch on the south transept of the Cathedral. Mr. W. H. THOMAS, the Chairman of the Bridge House Estates Committee, in moving the adoption of the committee's report, said with regard to the suggestion: "That proposal was undoubtedly a very excellent but a very expensive one, for it would involve an additional outlay of over a million." For the Philistine, whom we may take to be the predominant element in the Common Council, that settles it.

We do not admit that Mr. THOMAS's dictum is correct, but his figures must be shown to be wrong by any advocates of an alternative scheme to that adopted by the Corporation. On the face of it, we opine that a new street and bridge in a straight line from Southwark Circus to the south transept of the Cathedral, if of the same width as that proposed by the Corporation, would cost less than the circuitous route on the adopted plan. Aesthetically, there is no question that such an admirable scheme as has been suggested by Mr. A. W. S. CROSS and Mr. GEO. HUBBARD in the *Observer* is infinitely superior to that of the Corporation. But the Philistine does not care for æsthetic superiority accompanied by "an additional outlay of over a million."

For the enhancement of the amenities of life other than æsthetic our Philistine has a higher regard. Show him something that will shorten traffic routes and minimise the blocks in our streets, and he is willing to listen. Prove that the improvement in transport will pay a reasonable interest on the expenditure and he will embrace the improvement and find the money. In suburban planning make him recognise that cheaper roads and fewer houses to the acre will give him more air, light, and open spaces without an increase of rent, rates, and taxes, and garden cities will spring up like mushrooms. In this respect Messrs. CROSS and HUBBARD have in their explanatory letter not made sufficient of the excellencies of their suggestion. Their route is shorter and more direct. It admits of the application of the principle, so fully studied and elucidated by M. HENARD, of circulatory junctions of cross-traffic in the proposal of an elliptical place with the cathedral in its centre at the northern end of the vista, and a smaller one with the Shakespeare Memorial Theatre at the southern end. These, of course, would mean "additional outlay," but would be accompanied by additional very valuable frontages.

The strongest of all arguments that can be urged upon our Philistine for the adoption of architectural town planning is the resulting improvement in the healthiness of environment. Once get him to believe in this with the fervency of his present concern for "the drains" and town planning is a *fait accompli*.

A good beginning has been made by the Town Planning Conference in arresting the attention of the Philistine. The secular Press throughout the country has taken notice of it; the Housing and Town Planning Act has given a *locus standi* to architectural town planning. But it is not enough to merely arrest attention. The interest must be maintained and the topic of town planning and its advantages, æsthetic, if you will, pleasurable and hygienic certainly, and financial above all, must not be allowed to pass into forgetfulness as a nine days' wonder, but must be kept prominently to the front till the Philistine has absorbed the eunemics of town planning as he has those of sanitation.

It has been objected, with some show of reason, that the gathering of town-planning experts, advocates, and sympathisers brought together by the Royal Institute was not a conference but a congress. Discussion was not a feature of the meetings. Excellent papers were read, excellent illustrated lectures were given, but of fruitful discussion there was virtually nothing. To make a successful conference speakers must be allowed more than five minutes each, the papers must be printed and widely circulated beforehand, and in all the best-organised conferences they are "taken as read." Then there is an opportunity for the man who has something to say to realise the line of thought of the paper writers, to gather his own correlated facts and figures, to formulate his criticism. Whatever of conference has taken place during the month was not at the formal gatherings in Conduit Street, but in private meetings at the exhibition, on the excursions, and elsewhere in select coteries.

We are not prepared to support the view that the Executive Committee were wrong in making the formal meetings didactic rather than controversial. In the present state of our knowledge and experience of town planning in Great Britain, in the highly technical and experimental character of town planning we are perhaps

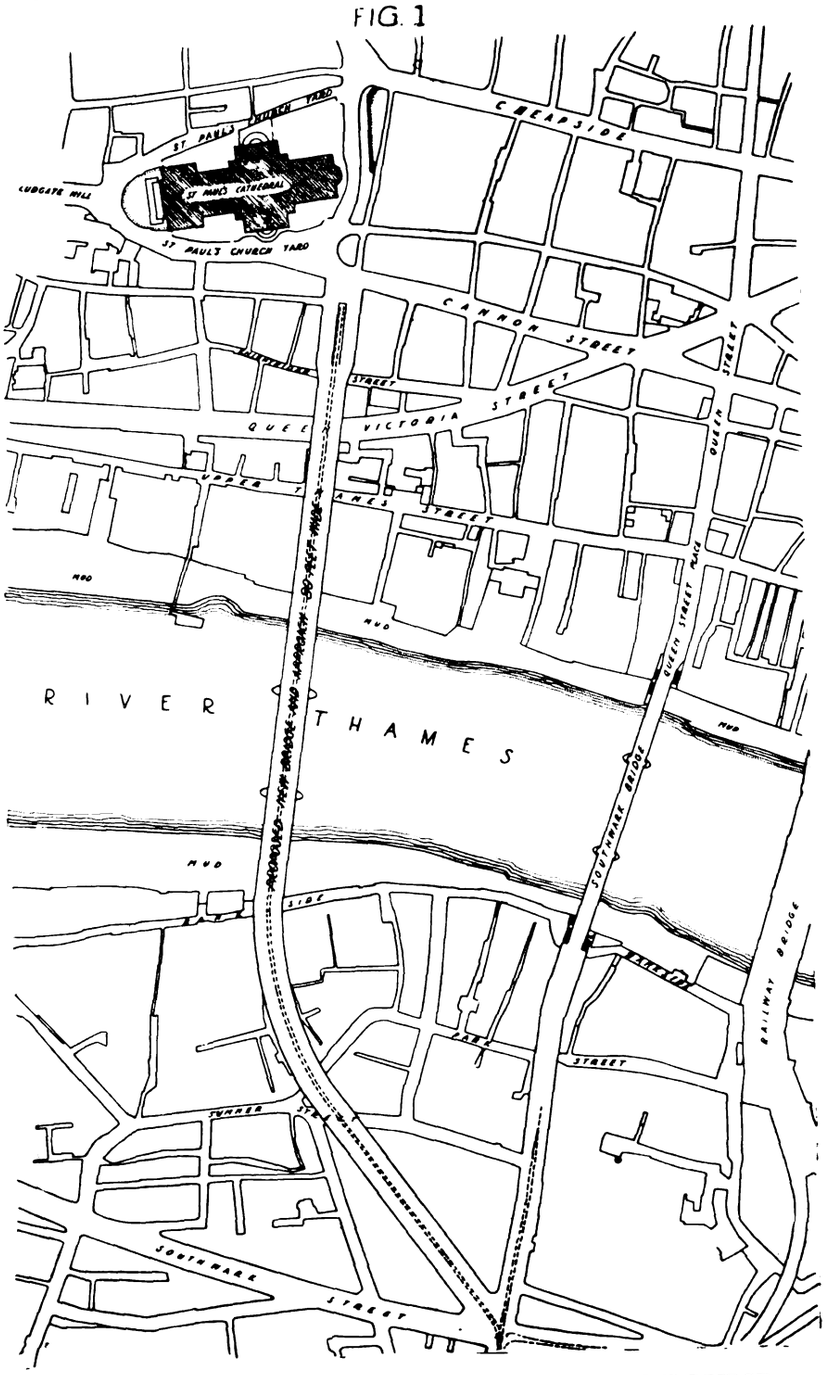
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in this country scarcely ripe for controversy. But it is already evident that there are two distinct schools of town planners—the school of the wide street, the stately vista, and the dignified frontage, the civic designers, as they call themselves, on the one hand; and on the other the advocates of the narrow road with distant frontages, the picturesque and piquant line, and the closed vista, the successful initiators of our garden cities and suburbs.

There were at the Conference murmurs not loud, but deep, against the idealistic point of view from which many of the readers of papers approached the subject of town planning, and these murmurs came from men who were more or less enthusiastic and concerned about the improvement in our city plans. Idealism therefore has still less chance of impressing the Philistine. Anyone with a parallel ruler, even the Philistine, can sit down and Hausmannise the plan of London. It needs no great perspicacity or genius to produce such a suggestion, admirable as we think it is, as Messrs. Cross and Hubbard have put forward for the St. Paul's bridge and its approaches. It is another thing to show that it would not "involve an additional outlay of over a million." Let our civic designers prove to the Philistine that their æsthetic conceptions connote sufficient recoupment to make them pay, and the municipalities throughout the kingdom will finance the expenditure. The promoters of garden suburbs have satisfied the capitalist, and it is "up against" the civic designers to do the same.

One thing that the marvellous collection of drawings and statistical charts from Germany now on view at Burlington House has shown us is that it is a fatal mistake for the purpose of finance to line wide streets and open places with file upon file of lofty blocks of tenements in flats approached from and lighted only by meagre internal courts. Berlin has realised its mistake in this respect, and is now above all things desirous of reducing the number of its one hundred thousand families in single-room tenements, in which undesirable concomitant of modern civilisation (!) it leads the world. Some praise has been bestowed upon the landowners whose development of their estates in the West End of London has given us the number of squares and open spaces in which

FIG. 1

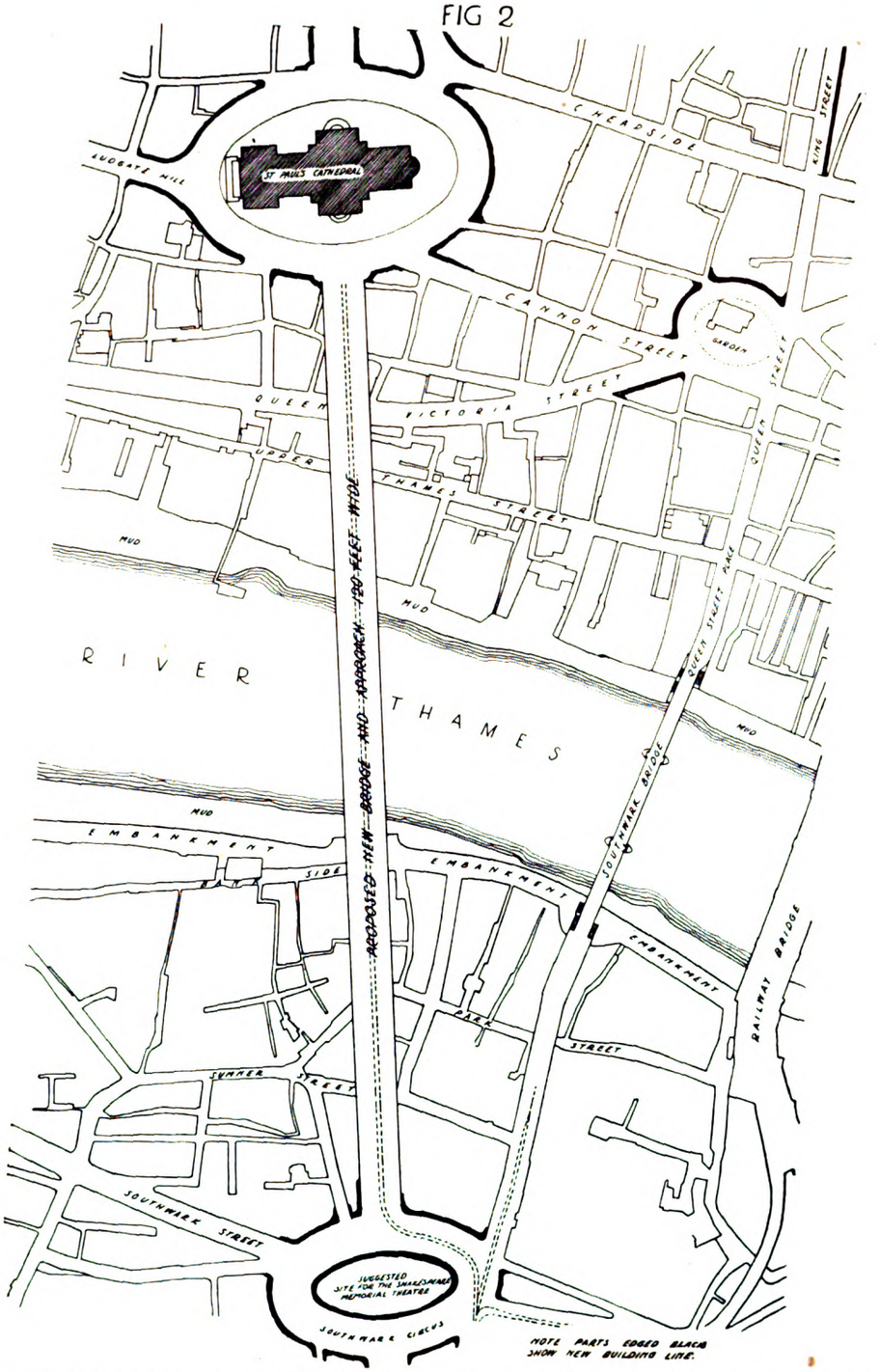


PLAN OF THE COMMON COUNCIL'S SCHEME FOR ST. PAUL'S BRIDGE.

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the Metropolis takes pride, but not a word was said of the miserable backyards and basements by which they are accompanied. Our present London Building Acts have made such backyards impossible in the future for residential buildings, and so rendered more difficult the task of our civic designers. We are completely in accord with the criticism of Professor Geddes on the policy of wide streets in front of and "germ-wells" behind our town dwellings. Such civic designing as this is hygienically

FIG 2



SUGGESTION FOR LAY-OUT OF ST. PAUL'S BRIDGE.—By Mr. A. W. S. Cross and Mr. Geo. Hubbard.

on a par with the now condemned system of back-to-back houses in our Northern manufacturing towns.

The Royal Institute has done well in arranging that the exhibition at Burlington House is to remain open for a week longer, until to-morrow, and we learn with pleasure that it is to be transferred to Edinburgh, whilst we believe that efforts are being made for its subsequent location in Glasgow, Liverpool and Manchester. The Housing and Town Planning Congress at Wrexham is another step in the right direction, and will, we hope, be followed by similar gatherings, with exhibitions, throughout the provinces, where interest is more readily aroused than in the inchoate mass of the Metropolis.

NOTES AND COMMENTS.

Lesnes Abbey Exploration Fund is badly in need of support. The Woolwich Antiquarian Society has made excellent use of the amount of about 120*l.* that has been already expended, and has obtained sufficient information to enable Mr. A. W. Clapham to determine the plan of the church, but further excavations are required to enable him to plot with any degree of certainty the monastic buildings. At present investigations are being made on the site of the infirmary, where one jamb of a doorway has been uncovered. We have made a very enjoyable visit to the site, and were struck with the excellence, both of workmanship and design, of the remains that have been unearthed, some of which we illustrated, with a descriptive paper on Lesnes by Mr. W. T. Vincent, in our

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issue of September 30. We can commend the work of the Woolwich Antiquarian Society at Lesnes as most interesting to visit and worthy of financial support. The greater part of the church was evidently built about 1180 A.D., and is strongly French in design, but there are other remains of about the middle of the thirteenth century and the early part of the fourteenth which, although their precise connection is not clear, show that later additions were made. A fine collection of floor tiles has already been made, and several interesting fragments of glass have been discovered.

At the meeting of the City Corporation held on the 20th instant, when the scheme for the new St. Paul's bridge was adopted, Mr. W. H. Thomas, the Chairman of the Bridge House Estates Committee, is reported to have repeated the incorrect statement in the report of his committee, to the effect that "the Royal Institute of British Architects suggested that the northern approach should open up immediately opposite the dome of St. Paul's Cathedral." And this although Mr. Leonard Stokes, the President of the Royal Institute, had publicly corrected the error in a letter to the *Times* which appeared on the 18th inst. We might suppose that Mr. Thomas does not read the *Times*, but we fear that the underlying thought is that those who pay the piper have a right to call the tune. This is just where the Corporation makes a great mistake. The Bridge House Estates Committee are not going to pay for the new bridge out of their own pockets, but out of funds of which they are trustees for the citizens of London—not only the freemen of the square mile, but the inhabitants of the whole County of London—and every individual citizen has a right to call his trustees to account if they muddle the expenditure of trust funds and neglect to do the only thing that the representatives of the Royal Institute of British Architects asked them to do, to obtain the best architectural advice before any scheme was decided upon.

Fortunately, the Corporation cannot proceed without Parliamentary powers, and the citizens of London are represented by a numerous body of members of Parliament, whose views will have very great weight when the matter comes up for discussion in Parliament. Every citizen of London who has any desire that the trust funds in the hands of the Bridge House Estates Committee shall be wisely expended in the beautification, and not the uglification, of London should address a personal request to his Parliamentary representative to support the advice tendered by the Royal Institute, and to use his vote and influence to ensure that the new St. Paul's bridge will be a credit to London, and not a disgrace, such as we fear the Corporation's adopted scheme would be, both practically and æsthetically.

One of the important stipulations of the British Standard Specification for Portland Cement (revised 1907 and 1909) is the determination of the ratio of lime to silica and alumina or hydraulic modulus. The Standard Specification prescribes a maximum of 2.85 and a minimum of 2.0 for the hydraulic modulus, and the calculation of this modulus from an analysis of any particular cement is quite a considerable operation. Therefore a simple slide rule,* arranged by Mr. D. B. Butler, A.M.Inst.C.E., F.C.S. (Henry Faija & Co.), which reduces the operation to a few seconds' mechanical manipulation, is a decided boon. We would suggest that, in the second line of instructions for use, future editions should show a full stop after the word "diagram," and commence a fresh sentence with "At the point."

We are glad to note that the Edinburgh Dean of Guild Court has in two cases set its face against what appeared to be an attempt to carry on the pernicious system of back-to-back houses. It is not much use having a Housing and Town Planning Act if back-to-back houses, with their incontestable unhealthiness, are still to be allowed to be erected.

* Published by John J. Griffin & Sons, Ltd. 2*s.* 6*d.*

It was an excellent idea to hold a workmen's meeting on town planning last Saturday, under the presidency of Mr. Leonard Stokes. The artisan has a personal interest in the practical side of town planning, and that interest is of account when he realises that improved town planning means better health for himself, his wife, and his children.

The Building Act Committee of the London County Council has done well, in our opinion, to recommend the Council to leave alone the question of paying district surveyors by salary instead of by fees. The greatest mistake the Council ever made in the administration of the London Building Acts was the substitution of surveyors devoting their whole time to the business of the Acts in place of independent architects of high position and experience. It has brought into existence a class of officials who dare not depart from the letter of the law, even when such departure would make for better building and for better prevention of fire. Salaried policemen would be even worse, and would scarcely dare to call their souls their own or to stir a step beyond the limits of their red-tape bonds. The older race of district surveyors had sufficient knowledge and experience, independence and courage to disregard the absurdities of the Act whilst maintaining the essence.

Mr. Austin Harford and Mr. T. Roberts, the representatives of the Liverpool Corporation at the International Housing Congress at Vienna in June last, and who also visited several of the important cities of Central Europe, have presented an excellent report, in which they compare the work done in Liverpool very favourably with other examples, and they say: "The enthusiasm and brainy energy of the Germans and Austrians for town planning are beyond all praise. The evangel of the city beautiful, largely due to their lead, has come to stay along with town planning, although in this country we are only emerging from our swaddling clothes in such matters. Some of the best minds of the country are successfully educating public opinion as well as local authorities, and time and intellect are certainly on their side in the effort. But in municipal housing Liverpool is a live, potent figure, and the manner in which she has got to grips with some of the very bottomest and acutest phases of the housing question—slum congestion and slum clearance, with cheap, healthy dwellings in their place, regardless of profit—raises her as a shining example to the whole world. Liverpool has already spent nearly 1,000,000*l.* on its housing of the people. A great deal more remains to be done. The Corporation dwellings will endure for many a lifetime, and are a valuable heritage to the future citizens."

The Local Government, Records, and Museums Committee of the London County Council have recommended that the Roman boat found on the site of the new County Hall shall for the present be removed to the vaults of the building for preservation, and they have reported as follows:—On July 5, 1910, the Council, on our recommendation, authorised expenditure on maintenance account, not exceeding 200*l.*, in respect of the removal and preservation of the Roman boat discovered on the site of the new County Hall, including the provision of a suitable shed for housing the vessel. The Establishment Committee now inform us that the contractors are pressing for the utilisation of the site on which the boat rests, and it is necessary, therefore, to decide at once the steps to be taken for its removal. We intimated in our report on the date mentioned that, in our opinion, the boat should be housed at the Horniman Museum. Various suggestions of other sites have been made, but, without prejudicing the question of the final location of the boat at the Horniman Museum, in any new museum of London antiquities which may be established, or at the new County Hall, we concur in a proposal of the Establishment Committee that the relic should be removed forthwith from where it now lies to the vaults on the site, where

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it can be treated for preservation. We have received a report from the Clerk of the Council pointing out that this boat is an unique relic of the Roman occupation of this country, and is therefore especially valuable as a London antiquity. It is, moreover, probably a relic of what was the first fleet constructed to defend Britain, namely, that under Carausius the Emperor (A.D. 286-293). It is pre-eminently an object which should receive the greatest care and be preserved and exhibited under the best conditions. All the articles found in the boat and its surroundings, which include coins, pottery, iron-studded soles of footwear, horseshoes, and other objects, should be associated with the boat when exhibited, together with plans showing the exact site where the boat and the several finds were discovered. We consider that the exact spot at which this interesting and valuable relic of a former period of London history was found should be indicated, and in communicating to the Establishment Committee our views with regard to the custody and preservation of the boat we have suggested that on the ground floor of the new County Hall the exact spot beneath which the vessel was discovered should be marked in a suitable way.

THE LEANING TOWER AT PISA.

PROFESSOR GOODYEAR has addressed the following letter to the editor of the *American Architect*:—

I am able to make an interesting addition to the points of my article of September 28, which related to the report of the Italian Commission on the Leaning Tower of Pisa.

An Italian translation of this article is in course of preparation, and it occurred to me that a diagram representing the difference in the results of the same plumb, as measured to level and as measured to slope, would be an interesting and useful addition to the article.

In my article of the 28th I had estimated (by compass test on the very small scale of the original De Fleury section of the Leaning Tower) that the De Fleury sixth-storey plumb would give a 10 cm. higher result on the measure to slope than it did on the measure to level.

In order to prepare an illustration bearing on the general principle for use in the Italian translation I instructed my draughtsman to make a drawing, four times enlarged, from that part of the De Fleury section which shows the ground floor of the tower, and to report to me what results would be obtained by the enlarged scale as regards the measure to slope.

Please note this diagram herewith. The additional amount on the measure to slope *is not* 10 *cm.* *It is* 7 *cm.*



Now 7 cm. is the amount which the Commission reports that the tower has moved since the De Fleury sixth-storey plumb of 1859 (if this sixth-storey plumb can be trusted, which the Commission doubts).

If we suppose that the Commission took a plumb from the sixth-storey opening, and that this plumb was measured to the surface slope, it appears likely or possible that the erroneous impression was thus derived that the tower had moved 7 cm. since the date of De Fleury's plumb. The correspondence of the figure of 7 cm. mentioned by the Commission to the difference of 7 cm. between the two measures shown by the diagram makes this hypothesis attractive, although it obliges us to assume that the Commission overlooked the point that the difference between sixth-storey plumbs would not be the same as the difference between seventh-storey plumbs.

In any case, this diagram offers a new suggestion as to the source of the (erroneous) rate of M.0.092 for inclination in 1910. If we divide the measure to the slope, on the diagram M.3.72, by the De Fleury axial height for the six lower storeys, which is M.40.24, we obtain the Commission's rate per metre of M.0.092 for the inclination of 1910.

It is a curious coincidence that the division of the De Fleury measure of the same plumb, as measured to level (M.3.65), by the Cresy and Taylor axial height for the same six storeys (M.39.65), also gives the result M.0.092. As the Commission generally figured on the Cresy and Taylor measures, this coincidence prompted the suggestion, in the article of September 28, that the Commission had taken a plumb from the sixth storey which had corresponded to De Fleury's, and that its rate of M.0.092 was thence derived.

At present this new theory for the origin of the (mistaken) rate of M.0.092 is the more attractive and plausible. Otherwise we should be obliged to suppose that the Commission had obtained a result which was identical with De Fleury's, and which it also imagined to be 7 cm. greater. This is still true in one sense, but not exactly in the same way.

The present additions to our explanations of the Commission's errors supplement, but do not change, my former main conclusions. They oblige us, however, to assume that the Commission used the De Fleury axial height in computing the average rate per metre of its own (unmentioned) plumb from the sixth storey, and that it did so without noting the discrepancy from the Cresy and Taylor axial height, which it had used in computing the rate of M.0.0865 for 1829.

The Commission's use of the De Fleury axial height might, however, be explained by its consultation of De Fleury's sixth-storey plumb, and by its consequent use of De Fleury's survey at the given time. Under the circumstances it may have been natural to estimate on this height without observing that it differed from the one used on the sixth-storey plumb of 1817.

At all events, it does not require any great stretch of the imagination to assume this error, when we reflect on the various and much more serious errors which have been demonstrated to exist in the Commission's methods and conclusions.

It would thus appear that there were three mistakes at the given point—the use of two different axial heights for the estimate of rates per metre at different periods, the oversight of the variation in the diameters of the well, which involved an underestimate of 8 inches (or M.0.20 on the inclination for the given height, and the error of computing the total movement of the tower from a sixth-storey plumb. As to the first and last of these errors we can only say at present that they appear both possible and probable, but we cannot say they are positively certain.

The main points of this communication are the suggestion of the possible reason why the Commission figured its results as being 7 cm. greater than De Fleury's, and the revision of the explanation of the method by which the (mistaken) rate of M.0.092 was determined. There is, however, an additional matter of considerable ultimate importance, which the great length of the article of September 28 prevented my debating there.

This is the question as to the accuracy of the record of the Cresy and Taylor sixth-storey plumb of 11 feet 2¼ inches, or M.3.41. The inclination established by that plumb when corrected for the differences in the half-diameters of the upper and lower parts of the tower well is M.3.61 (or M.3.41, M.0.20 correction). This inclination of M.3.61 appears too great for the given height, in comparison with the Cresy and Taylor total of M.4.00. There is no text description to verify this plumb, and there are several serious errors of record or transcription in the Cresy and Taylor surveys, besides those mentioned in the last article, which would make the existence of such an error quite credible.

The probability of such an error appears to amount to certainty. The average rate for the Cresy and Taylor sixth-storey plumb is M.0.091, and the inclination for the remaining height of M.7.29, at this rate, is M.0.66, which added to M.3.61 gives a total of M.4.27, whereas we know the true total to be M.4.00.

On the other hand, when we calculate the De Fleury sixth-storey rate of M.0.0955 on the same height, the total is only M.4.54, or only 4 cm. greater than the true De Fleury inclination of M.4.50. Thus the Cresy and Taylor

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excess of M.0.27 is much greater than could be explained by the known fact that both the sixth-storey rates are slightly too high. These are my reasons for believing the record for the sixth-storey Cresy and Taylor plumb to be in error.

The following errors of transcription in the English original Cresy and Taylor surveys have not been hitherto mentioned. In the English original for the exterior view of the tower the eighth storey north side is figured as 44 feet 6 inches high. Grassi has corrected this error to the figure 24 feet 6 inches.

In the English original of Cresy and Taylor for the interior section of the tower both sides of the eighth storey are figured as being 24 feet 6 inches high, whereas the English original of Grassi's illustration (which makes the mistake of 44 feet 6 inches on the north side) figures the south side as 23 feet 7 inches high (or 11 inches less) than the same side in the other plate. Grassi has followed the latter figure in both his plates, and as the north side of the eighth storey is actually higher than the south side, Grassi took the right course in preferring the unequal measure, although Rohault de Fleury only figures about 6-6½ inches lower height to the south side of the eighth storey (14-16 cm.).

Besides these hitherto unmentioned errors in the English original there is the error of 1 foot in the exterior plumb from the cornice of the first storey; 2 feet 4 inches in the English original, properly corrected by Grassi to 3 feet 9 inches. There is also the error of the English original for the position of the line for the plumb through the grating of the eighth storey platform, which figures 13 feet ½ inch distance of the line from the south wall, when the figure should be, according to statement in text, 13 feet 1½ inches, and which figures the line as distant 12 feet 8 inches from the north wall when it should be, according to statement in text, 12 feet 6 inches. These errors have not been corrected by Grassi, and are shown in my article. The statement in text is verified by the computation in text, and is also verified by the ground plan of the eighth storey. It is therefore certainly the correct one.

These various errors allow us to presume that the Cresy and Taylor interior plumb of 11 feet 2¼ inches (M.3.41) from the sixth storey opening is incorrectly transcribed or measured, in view of the other convincing reasons for this opinion.

CHELMSFORD, GREAT BADDOW AND DANBURY.*

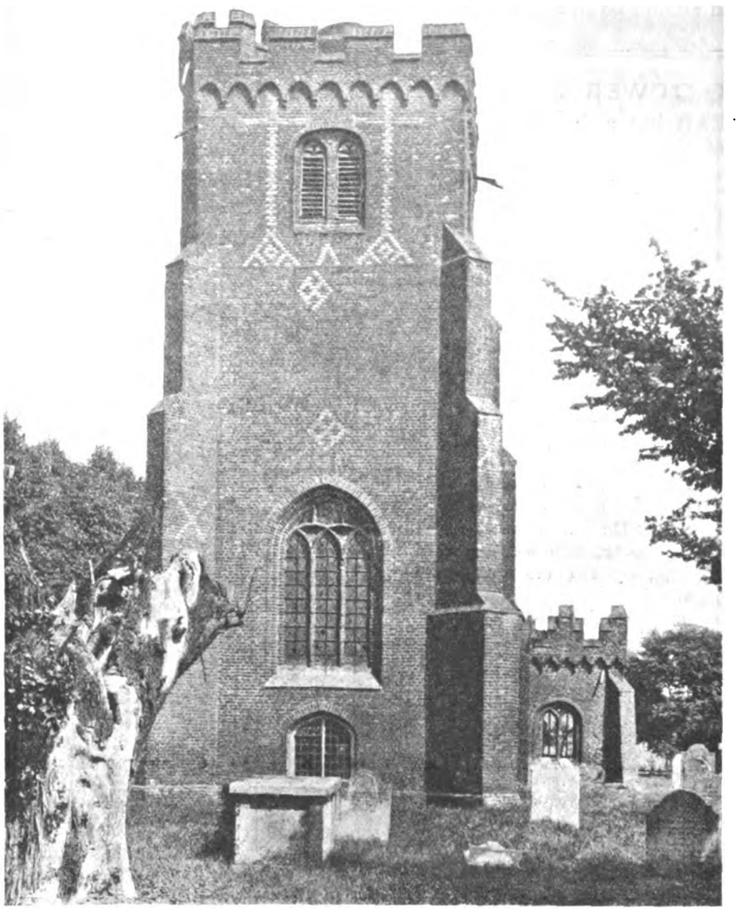
(*Concluded from page* 237.)

THE ancient name appears to have been Bedenestede or Bedenesteda.

Sandon.

The church of St. Andrew is pleasantly situated on one side of the village green.

It is probably of Norman foundation. The twelfth-century piscina found in a buttress during restoration is an early evidence of Norman character.



SANDON CHURCH, ESSEX.—WEST TOWER.

Architecturally the tower and south porch are of supreme interest. Even in this county of remarkable brick towers, with Ingatestone and Fryerning included, Sandon stands foremost as proving the suitability of brick for ecclesiastical architecture, unequalled for severity and restraint. It has the usual brick spiral stair and a rather unusual brick dome over the bell chamber. In my opinion this feature gives a remarkable quality to the peal of bells.

The pulpit is a good example of Perpendicular woodwork, and the roof has been good.

Danbury.

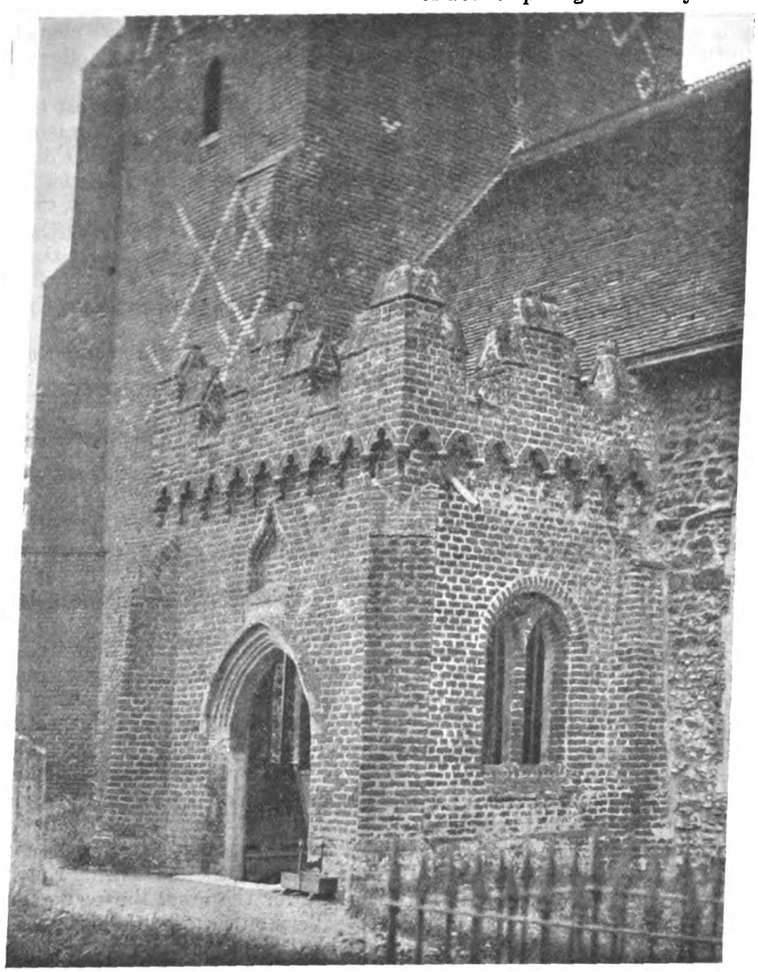
This pretty village, set on a hill 380 feet above the sea, the highest in Essex, seems to have derived its name from Danes Burgh, camp of the Danes. The unquestionable remains of fortification have always been attributed to Danish origin; but it may safely be assumed that the Romans had a post on a spot of such strategic importance commanding their Watling Street only two miles distant;

* Read at a meeting of the Upper Norwood Athenæum by Mr. Harold F. Murrell, A.R.I.B.A.

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there are remains of Roman tiles in the church. The church of St. John the Baptist is probably of Norman foundation, but the present building is in the Decorated style much restored.

The church has suffered, owing to its exposed position, from lightning, being largely destroyed in 1402, and the spire again in 1750. On the former occasion, an old story has it, the devil, habited as a Franciscan friar, was seen busy in the chancel "insolissma debauchans." The hagioscope is a remarkably fine one of quite unusual length; the small window on the north side of the chancel opening into the vestry is an unusual feature. To an archæological taste the great attractions of the church are its effigies of Crusaders, two in the north and one in the south aisles. These were probably members of the St. Clere family of the twelfth century. Their attitudes are significant; all are cross-legged with their feet upon lions. One is lying in prayer; one is returning his sword to its scabbard; the third is drawing his sword, its point resting upon a serpent.



SANDON CHURCH ESSEX.—SOUTH PORCH.

But of even greater interest was the discovery in 1779 of the actual coffin of a Crusader beneath one of the niches in the north aisle. Beneath a very massive stone a leaden coffin was found; within this one of elm ¼ inch thick; within this another shell ¾ inch thick covered with a resinous cement; within this the body was disclosed lying almost immersed in a liquor of pickle resembling mushroom catsup. Our chronicler appears to have been a man of fortitude; he naïvely adds:—"As I never possessed the sense of smelling, and was willing to ascertain the flavour of the liquor, I tasted and found it to be aromatic, though not very pungent, partaking of the taste of catsup and of the pickle of Spanish olives." Feathers, flowers, and herbs were found floating on the liquor. The general appearance of the body gave the idea of hearty youth. It seems probable that the Crusaders brought back with them Eastern methods of embalming, and evidently employed them to good purpose. It is a relief to know that the knight was decently reinterred, and we have probably walked over his remains this afternoon. In conclusion, we admit that amongst the great county names Essex does not fire the imagination as Devon or Yorks. We think, naturally, of the gloomy eastern suburbs—Stratford, Barking, Romford; we think of cheap watering-places and muddy flats.

But let us remember in future that Danbury Hill, at least, is not quite level; that there was a great Roman Essex, a romantic crusade-going Early English Essex, a Tudor Essex of great and stately houses. And for to-day the Scotch are admitted to know a good thing when they see it. Perhaps we are not all aware that Lowland farmers have been settling in Essex in hundreds during the last few years.

Need I say more?

COMPETITION NEWS.

Bournemouth.—J. E. Beale's Premises.—The Council of the Society of Architects desire to point out that the conditions of this competition are in their opinion so unsatisfactory that they urge upon the members the desirability of not competing.—The Royal Institute of British Architects inform us that particulars of this competition have reached the competitions committee so late that they do not feel justified in recommending the Council of the R.I.B.A. to debar members from competing, as they otherwise would have done, but they desire to point out that the conditions are very unsatisfactory.

Coventry.—From seven sets of competitive plans for the erection of a new school in Centaur Road the education committee approved last week the selection of those of Mr. Frederick Foster, Coventry, who was appointed architect for the work at a fee of 650*l*. Plans for the enlargement of Stoke Council School so as to provide 793 extra places, at a cost of 10,400*l*., were also passed for submission to the City Council. Mr. S. N. Cooke is the architect.

Havana.—With reference to the notice in *The Architect* of September 16 relative to an international competition of projects for a palace to be erected at Havana for the President of the Cuban Republic, H.M. Legation at Havana now report that proposals will be received by the "Secretario de Obras Públicas," Havana, up to April 15, 1911, from local and foreign architects and builders. The building is

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to be erected in the centre of a quadrangle 43,400 square metres in area, and within a rectangle of 60 by 80 metres. It is to consist of three storeys, and must have an interior court ("patio") surrounded by at least two of the storeys. The total cost of the work, exclusive of the value of the land, is not to exceed 985,000 pesos currency. Prizes of 10,000 pesos and 5,000 pesos are offered for the two best models or projects presented.

San Salvador.—H.M. Consul (Mr. W. E. Coldwell) has forwarded particulars to the *Board of Trade Journal* of a project for the construction of a theatre at San Salvador, having a seating accommodation for about 1,200, at a cost of 800,000 francos. Of this sum 600,000 francos is to be allocated to the building and 200,000 francos to decoration, &c. All materials may be imported free of duty. Designs, plans and estimates should be submitted to the "Secretario de la Junta de Fomento, 92 Avenida Norte," San Salvador, before March 15, 1911. Prizes of 8,000 francos and 4,000 francos are to be awarded for the two best designs submitted, the designs in both cases to become the property of the "Junta de Fomento."

Stockport.—In the competition for the Carnegie Library, Mr. P. Scott Worthington, President of the Manchester Society of Architects, has awarded the first premium of 50*l.* for designs to Messrs. Bradshaw & Gass, architects, of Bolton. The architects' estimate of the cost is 9,700*l.*, and the total cost for the building and furnishing is estimated at a little over 14,000*l.* The assessor awarded the second premium of 30*l.*, to Mr. Joseph Holt, of Albert Square, Manchester, and the third of 20*l.* to Mr. George H. Wenyon, of Dudley.

PEMBROKE COLLEGE, OXFORD.

By the Rev. Douglas Macleane, M.A.

WHATEVER interest belongs to an edifice through being the earliest specimen in Oxford of nineteenth-century Gothicising, as applied on a considerable scale to domestic buildings, may be found in the front of Pembroke College, which, until the year 1829, was a pleasing piece of Stuart architecture —Jacobean at one end and Palladian at the other. The present gateway oriel is an imitation of a window in John of Gaunt's palace at Lincoln. At the eastern corner of the front, however, may be noticed a bust of Queen Victoria, as newly crowned, with the date 1838. The fact is that that side of the Old Quadrangle was left incomplete for some years in the prospect of the demolition of the dilapidated Wolsey Bedehouse, the idea being to give Pembroke a handsome façade to the road, and to enable a better view to be obtained of Christ Church. This was suggested as early as 1773 in Tatham's *Oxonia Explicata et Ornata*. Happily, the interesting old Spital, which had passed through many vicissitudes, was preserved, and a quarter of a century ago Christ Church sold it to Pembroke for 11,000*l.* In 1834, however, the north side was rebuilt and set back, so as to make room for a carriage-way to the College. Some ancient tenements standing in St. Aldate's churchyard were removed at the same time, and the high churchyard wall was superseded by railings. Thus for the first time the College could be seen from the street. But the old approach, as Turner sketched it (National Gallery water-colour 805), must have been extremely picturesque. Nor could anything have grouped more delightfully with the Almshouse and the old College front than the venerable and exquisitely beautiful parish church, as, alas! it was. A water-colour in the common-room by Prout gives a charming idea of it.

Before entering Pembroke the visitor should take notice of this once remarkable church, which has been so cruelly robbed externally of every bit of grace and interest. The very name "St. Aldate" is mysterious. Mr. James Parker holds that there was never such a person, and that this, like the Gloucester St. Aldate's, is simply Aldgate Church, the old south gate of the city having stood close by. Early in the twelfth century, however, we read of "ecclesia S. Aldæ," and the traditional pronunciation "St. Old's" is found in 1226. A glance at any print earlier than 1842 will show that this church had a south aisle—now lengthened—of the purest Decorated architecture, above which was a long battlemented chamber, lit by six Perpendicular windows and reached by a newel staircase at the south-west external corner. The aisle, called Trinity Chapel or Dokelynton's Chantry, served the students of Pembroke College, originally Broadgates Hall, for religious purposes until the building of the present chapel in 1732. The chamber above it was the College library until 1710, but in the Broadgates days it was a civil law school, St. Aldate's being the mediæval centre of the principal district of the town for legists, and Broadgates Hall their chief receptacle. A number of Broadgates and Pembroke worthies are interred in Dokelynton's aisle—the fine tomb of Principal Noble (ob. 1522) has been moved, however, into the chancel—and the visitor may like to be told that here worshipped Cardinal Repyngdon, Heywoode the epigrammatist, Bonner, Story, Jewell, Beaumont, Peele, Camden, Pym, Sir Thomas Browne, Scroggs, Johnson, and Shenstone. When Whitefield entered Pembroke the new chapel was just built. An intensely human interest clings also to the Master's Lodgings, fronting the west end of the church, for there took place many of the raciest talks related by Boswell during one or other of Johnson's many visits to Dr. Adams, and issuing from that door the great man, in full academicals, gallanted Hannah More about Oxford. In the drawing-room King Edward VII. was matriculated by Dr. Jeune. Jeune, by-the-by, added a storey to the house, which was Gothicised at the same time as the College front. It was he who sold the advowson of St. Aldate's—a gift from King Charles I.—to the Simeon Trustees.

(To be concluded.)

ILLUSTRATIONS.

COMPETITION DESIGN FOR USHER HALL, EDINBURGH.

THE accompanying illustrations are reproduced from drawings submitted in competition for this concert hall. The author has attempted in his design to realise the correct character inseparable from the dignity of civic art, and to further this idea has based the scheme upon the highly academic system of architectural design as understood by the leading architects of the Classic revival. The great aim in the planning was to attain a system of definite classification of the seating according to price, and the rapid clearing of the building. The staircases and accesses have been specially considered with a view to the separation of the audience so classified. For this reason the orchestra was placed at the front facing Lothian Road. The principal entrance to the stalls and grand circle is at the rear of the orchestra. Entrances also are provided in lane for the area, the rear gallery on the first floor and gallery on the second floor. Each section of the audience has thus a separate entrance, crush hall, retiring and cloak rooms. The author of the published design is Mr. C. Harrold Norton.

OXFORD COLLEGE SERIES, PEMBROKE—EXTERIOR OF HALL, AND QUAD—OLD QUAD.

WE resume our series of views of the Oxford Colleges with those of the exterior of the Hall and Quad of Pembroke, a descriptive historical account of which college we also include.

LYGON PLACE, EBURY STREET, S.W.

THESE buildings, by Messrs. Eustace Balfour & Turner, have a character of their own which makes them distinctive examples of modern London architecture.

THE SEDILIA, PARISH CHURCH, ALL SAINTS, HOVE.

IN *The Architect* of July 2, last year, we published a view of the new reredos in this church, and now give an illustration of the sedilia, which were designed by Mr. Frank L. Pearson, executed by Mr. Nathaniel Hitch, and dedicated on All Saints Day, 1908.

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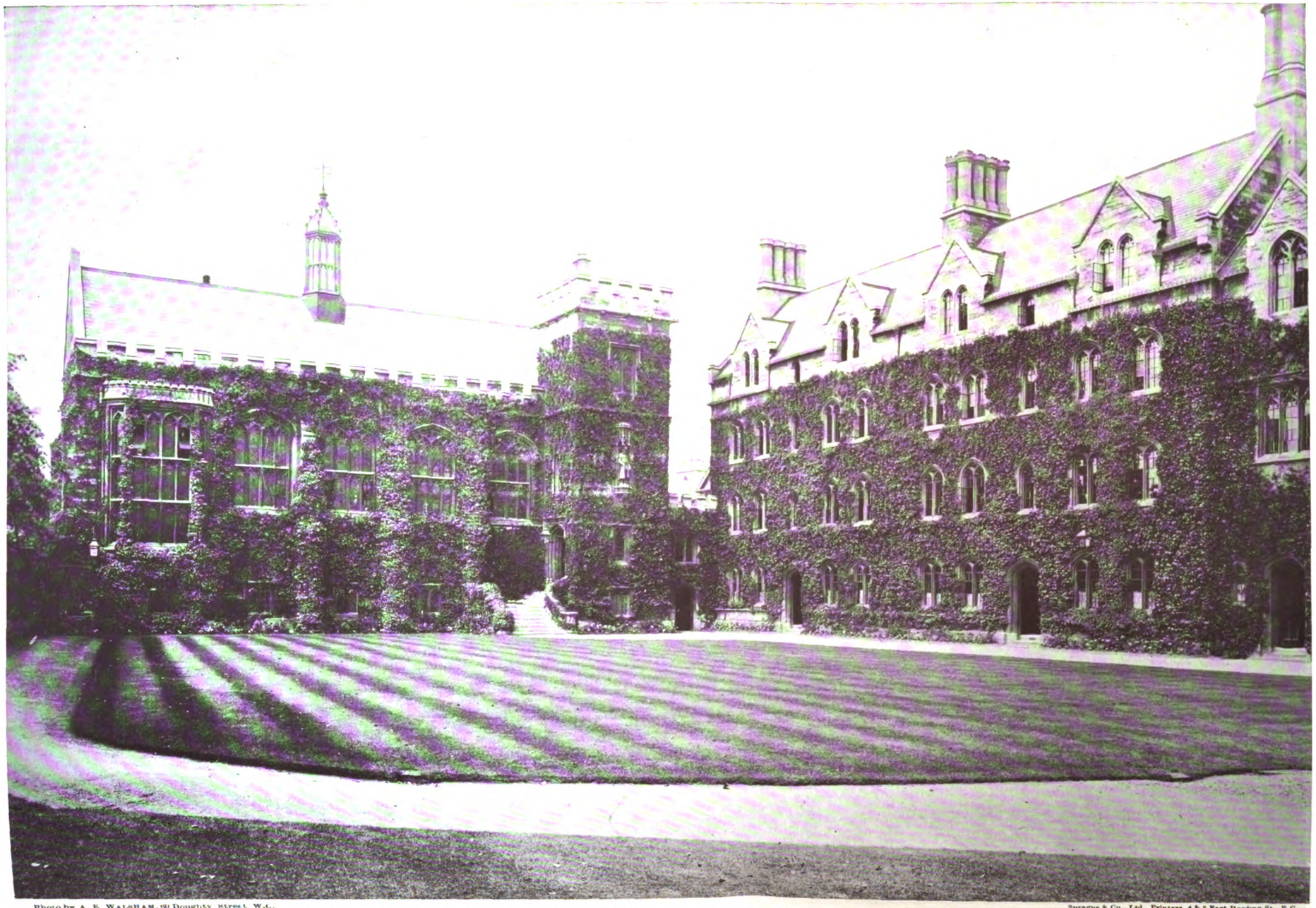


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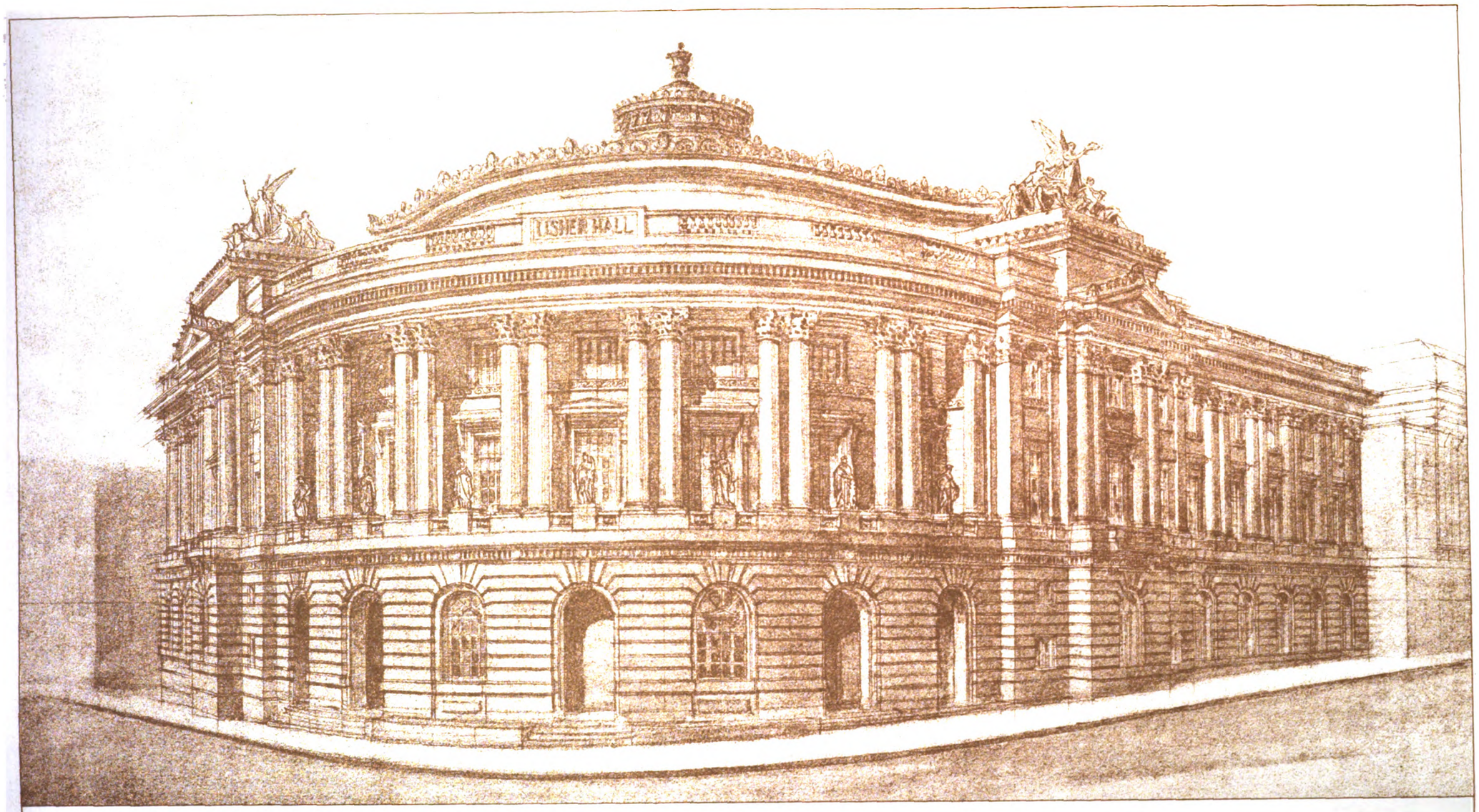
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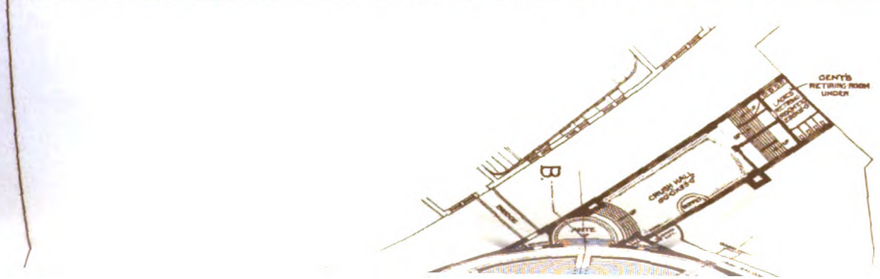
OXFORD COLLEGE SERIES. No. 87.—PEMBROKE: EXTERIOR OF HALL, AND QUAD.

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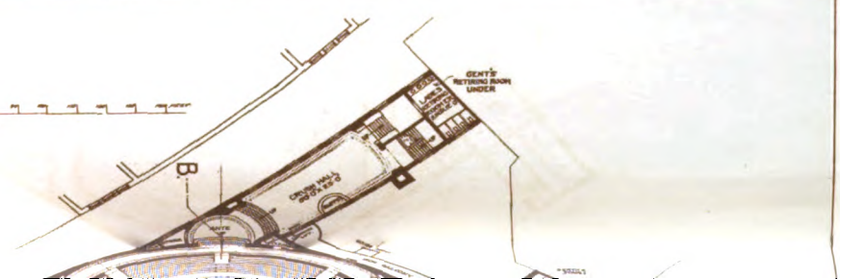
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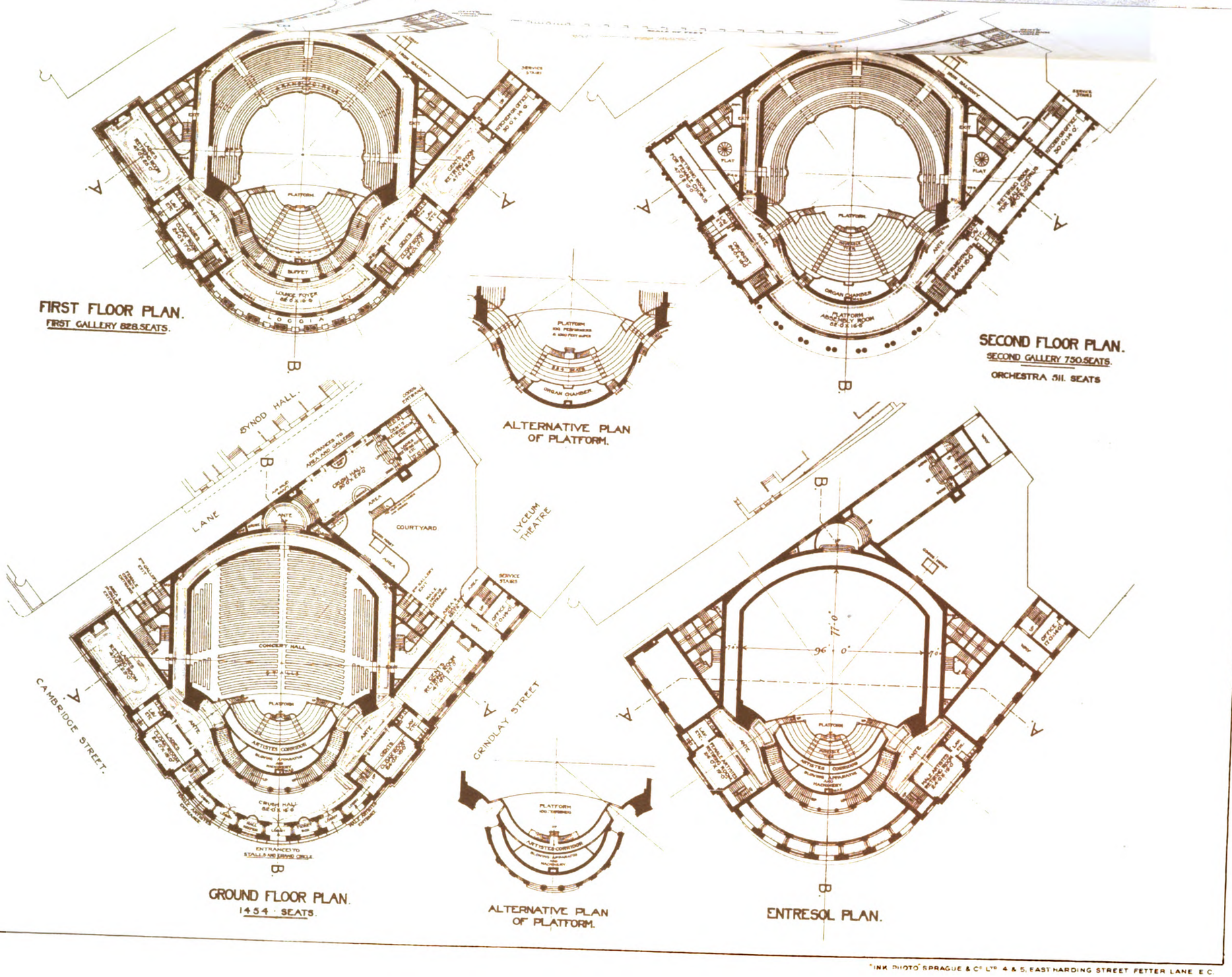


SCALE OF FEET.

W.A.D. DENOTES WARM AIR DUCTS.
P.D. " " PASS DOORS.
F.H. " " FIRE HYDRANTS.



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COMPETITION DESIGN FOR USHER HALL, EDINBURGH.

By Mr. C. HARROLD NORTON

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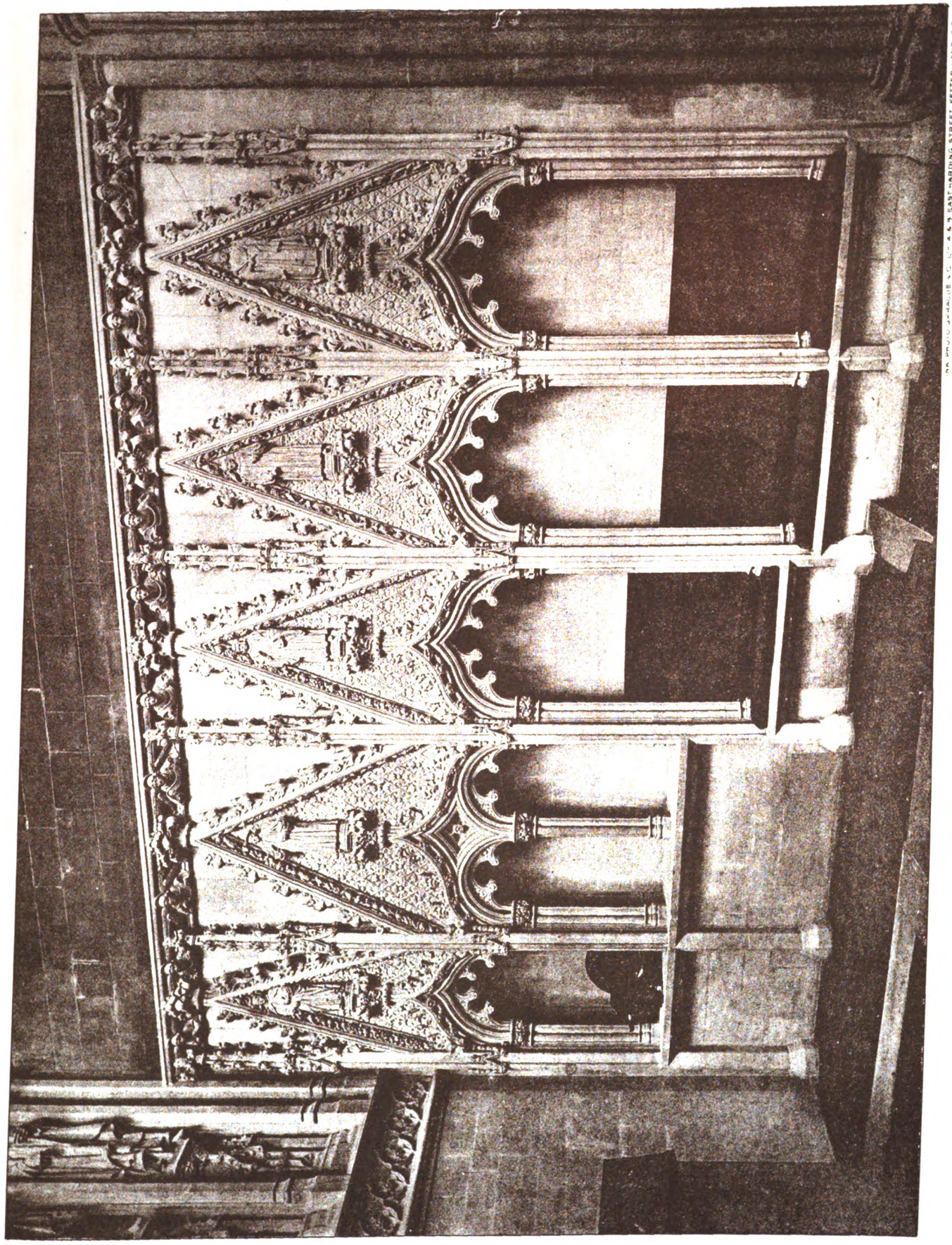
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LYGON PLACE, EBURY STREET, S.W.

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THE SEDILIA: PARISH CHURCH, ALL SAINTS, HOVE.

MR. FRANK L. PEARSON, F.R.I.B.A., Architect.

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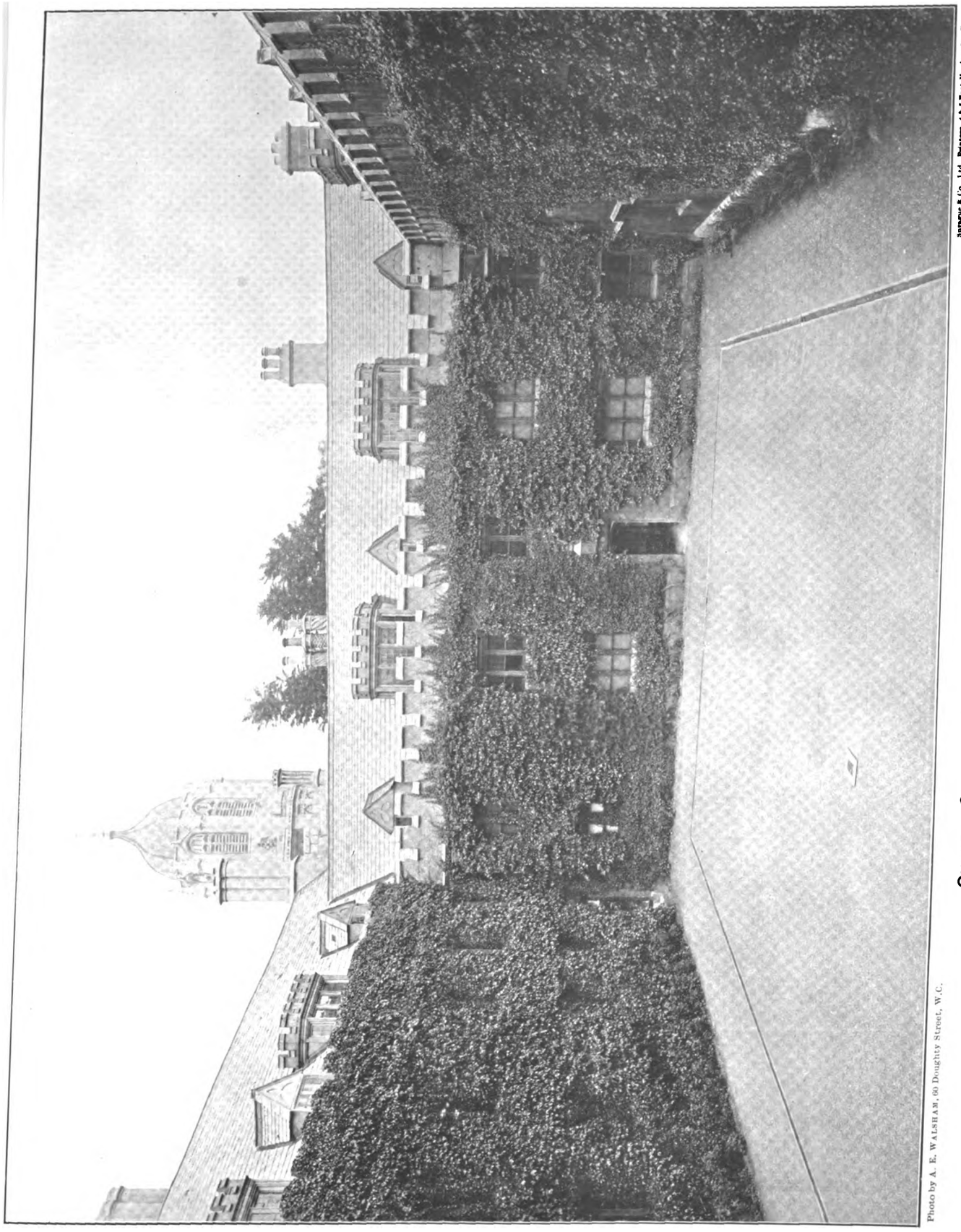


Photo by A. E. WALSHAM, 60 Doughty Street, W.C.

OXFORD COLLEGE SERIES. No. 88.—PEMBROKE: OLD QUAD.

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MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

XXI.—THE COOLING OF AIR SUPPLIES (*continued*).

THE description of the Cologne Theatre given in the last article shows what an air-cooling plant consists of when fully installed. The arrangement is interesting, because it was not until the ventilating ducts, &c., had been designed and practically completed that it was finally determined to put in the refrigerating machine. For this reason it is most instructive, as, although the plant might possibly have been arranged to better advantage had the designers been unfettered in their ideas, the practicability of adding a cooling plant to the existing appliances without undue inconvenience is most clearly demonstrated. In fact, to show how well it fitted in with the ordinary arrangements at Cologne, it may be mentioned that the boiler used to provide steam for driving the compresser is none other than that originally intended for supplying steam to the stage. Now, when the boiler is required for that purpose, the cooling plant is temporarily shut down—its action, owing to the "cold" accumulation spoken of, being unimpaired—and when the stage requirements have been complied with it is restarted.

This was one of the main reasons for selecting this example of an air-cooling installation—to show how easy it is to fit the plant to existing appliances. We now propose to go one step further and to illustrate an up-to-date ventilating plant, where no artificial cooling is at present attempted, with a view to explaining how such cooling might with comparatively little expense be applied.

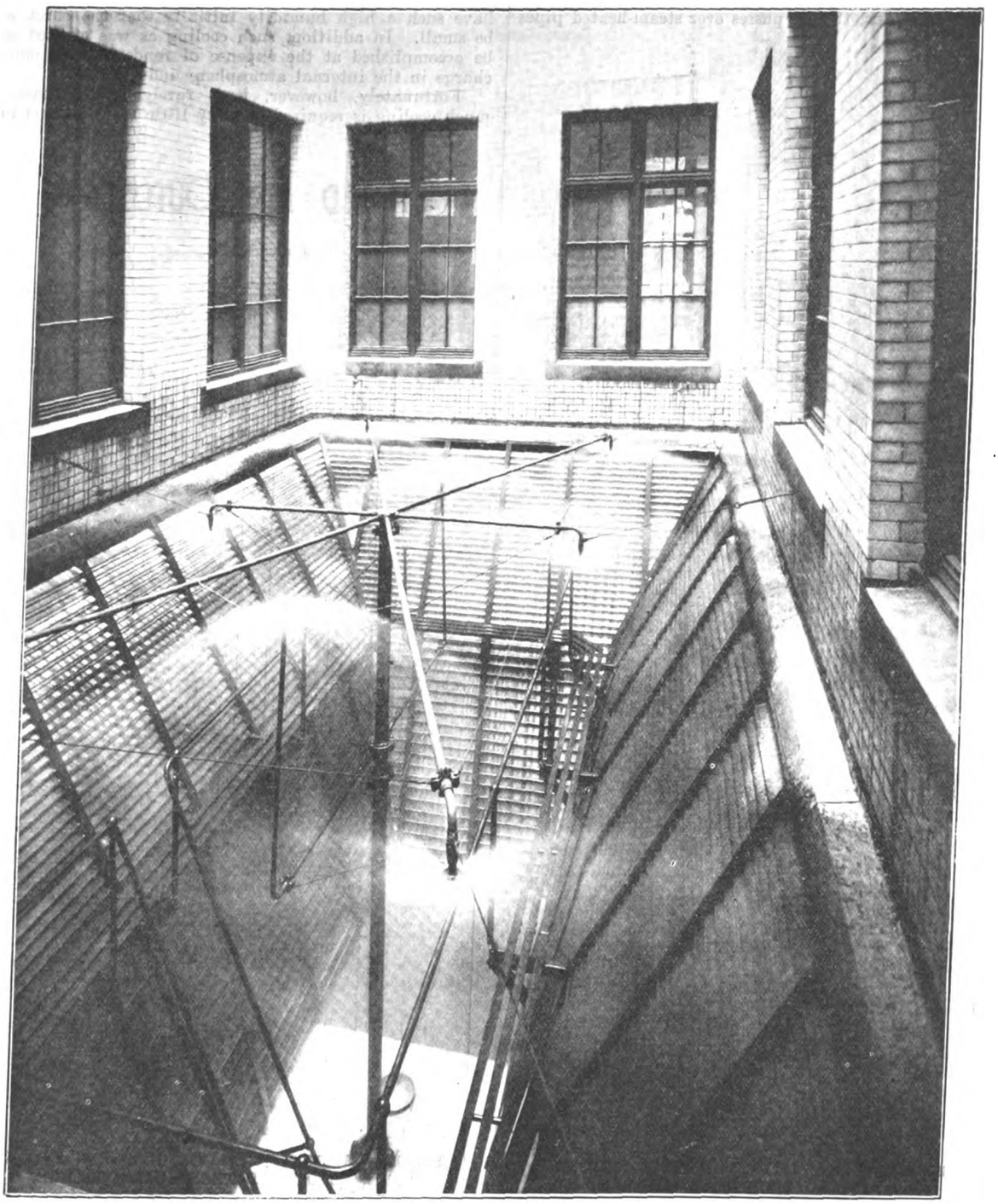


Fig. 64.—AIR-CLEANSING ARRANGEMENTS, GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.

The plant referred to is in use at the Glasgow and West of Scotland Technical College, one of the largest institutions of its kind in the country, and is shown in the accompanying illustrations, which are reproduced through the courtesy of the directors. It consists of a central shaft, cooling lattices, fans, heating-coils, distributing-ducts, and the entries and exits to and from the various rooms. The central shaft measures 31 feet by 18 feet, and extends from the top of the six-storey building (its walls being carried above the sur-

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rounding roofs) right to the basement. At the bottom is a series of glass louvres converging towards a point, and over these water is continually being sprayed by distributing apparatus (as illustrated in fig. 64), which is fed by a pump circulating the same water repeatedly. The air is sucked down the shaft and through the louvres by three fans, 10 feet, 9 feet, and 8 feet in diameter respectively, and in its passage becomes filtered by the water, also cooled in summer, to a certain extent, by evaporation. The efficiency of the apparatus, as far as the filtering is concerned, is well proved by the fact that so much sediment collects in the receiving tanks beneath the louvres as to make a periodic renewal of the water every three days a necessity (fig. 66).

Leaving the fans, the air passes over steam-heated pipes

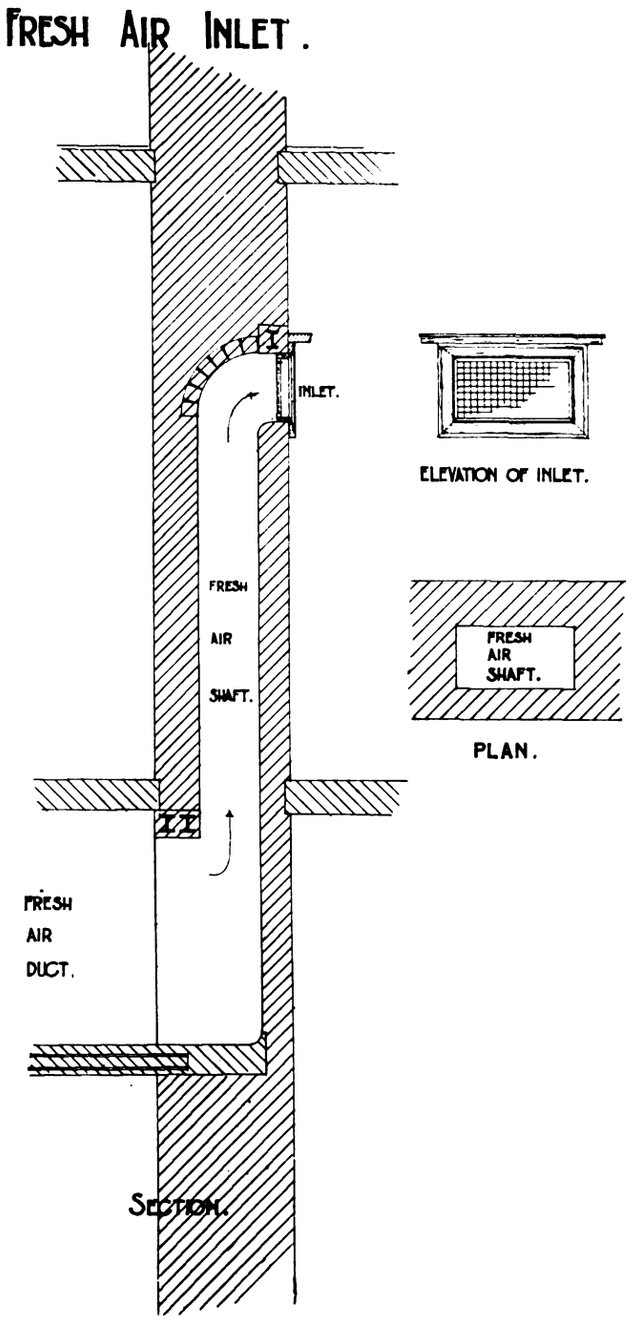


Fig. 65.—AIR INLET SHAFT, GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.

and by large ducts to the various parts of the building, the area of the ducts, which are finished in hard white enamel, being gradually reduced as the distance from the fans increases. The side branches are in the form of vertical shafts (fig. 65), which rise from the ducts to 8 feet above the level of the rooms into which they are to discharge. Before each of these shafts there is a secondary heater, through the action of which, aided by a damper, the temperature can be regulated at will. Sufficient area is provided in all cases to allow of the air being changed four times per hour in class-rooms and six times per hour in laboratories, the velocity in the shafts not exceeding 6 feet per second.

The exhaust shafts are similarly built into the walls, but have two openings, one at the top and one at the bottom of the room, so arranged that when one is open the other is necessarily closed. All the vitiated air is collected from them into passages and discharged into the outer atmosphere through roof ventilators.

So much for the ventilating system, which, with the exception of the spraying apparatus, is of the ordinary "Plenum" type. The question now is, How could a refrigerating plant be applied to this building?

At present there is no organised attempt at cooling the air. Incidentally, of course, its temperature is slightly reduced by the evaporation of the water in the cleansing louvres, but in a moist place like Glasgow the air would have such a high humidity initially that the effect would be small. In addition, such cooling as was effected would be accomplished at the expense of rendering the moisture charge in the internal atmosphere unduly high.

Fortunately, however, it is rarely in this case that much cooling is required, as very little work is done in the

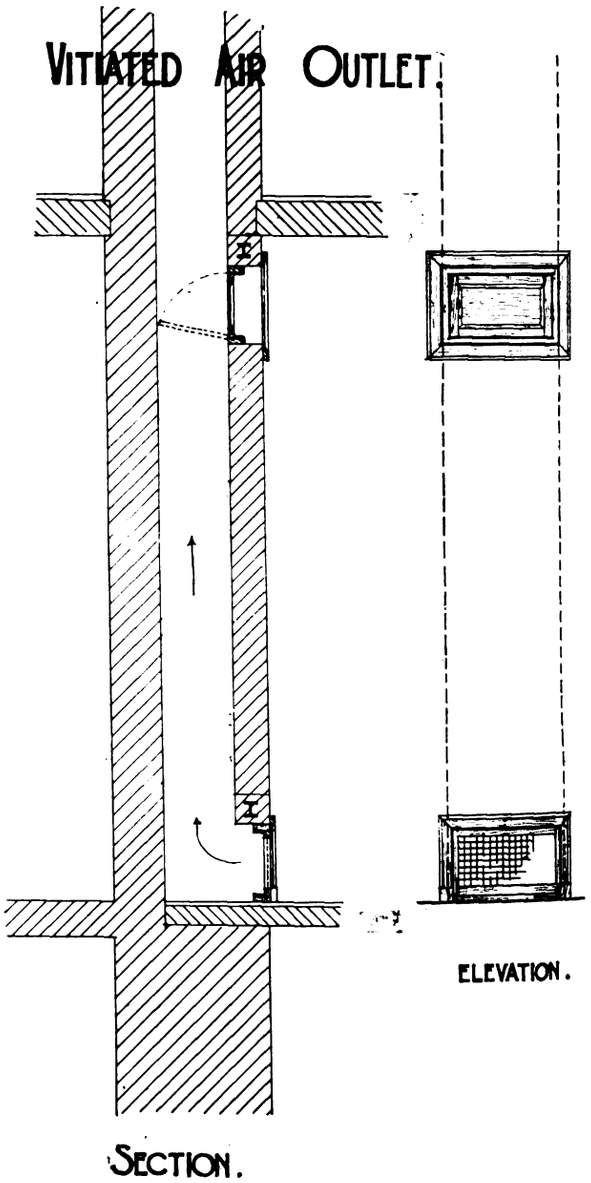


Fig. 65.—AIR OUTLET SHAFT, GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.

college during July, August, and September, and the Glasgow temperatures during the remaining months of the year cannot be said to be excessive. On the other hand, there is no doubt that, in a warmer climate, cooling apparatus would be desirable in such a structure, and we now propose to show what form it would take.

As usual, there would be three essential units in the system—compressor, condenser and evaporator. In this instance the last-named would be composed of coils made from lap-welded tubing, which would be similar to those used for other applications we have dealt with. They might be arranged in a large number of sections, forming alternatives to the heating-coils, which belong to the vertical

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shafts; but this would necessitate an extremely expensive plant, from the complexity and extent of the connections. A simple and almost as effective method would be to group them, as in the case of the Cologne Theatre, in one chamber, through which the air can be passed as required. But this would mean that the plant could run only when air is being cooled, which would necessitate a large and costly compressor. It would be better, therefore, if we could accumulate cold during the hours of the day when there is little need to cool the air, and thus economise by using a smaller compressor and condenser. For this purpose brine circulation is essential, although in adopting it we must submit to the uneconomical running it entails as compared with direct expansion. As we have already seen, this is due to the lower back pressure, meaning higher power-absorption at the compressor. The saving in first cost, also, is not so great as it appears at first sight, owing to the fact that about 50 per cent. more piping must be used with brine than with direct expansion, but it is sufficient to warrant the adoption of the system.

We must next determine the maximum quantity of air to be dealt with. In the case of the Glasgow College there are three fans, the diameters of which have been given respectively as 10 feet, 9 feet, and 8 feet, and it is improbable that they would ever be called upon to supply more than 180,000 cubic feet per minute to the building (30 cubic feet per minute each for 6,000 persons), although their actual capacity would be 300,000 cubic feet when running at a maximum speed. Taking this figure, and assuming (for a fairly warm climate) similar conditions to those taken in the Cologne Theatre calculation, we may take the B.T.U.'s to be absorbed per hour as proportionate to the deliveries of air.

At Cologne the air delivery (excluding the gallery) amounted to just over 30,000 cubic feet per minute. In this case we have, therefore, to absorb six times as many B.T.U.'s, or 6 × 940,000 = 5,640,000 per hour. Taking, as at Cologne, a compressor of just over one-fifth this capacity (since the load due to evening classes is similar), we have 1,200,000 B.T.U.'s per hour as the quantity to be extracted from the brine by our machine.

We have now determined the size of the compressor, condenser and evaporator, and the only remaining question is

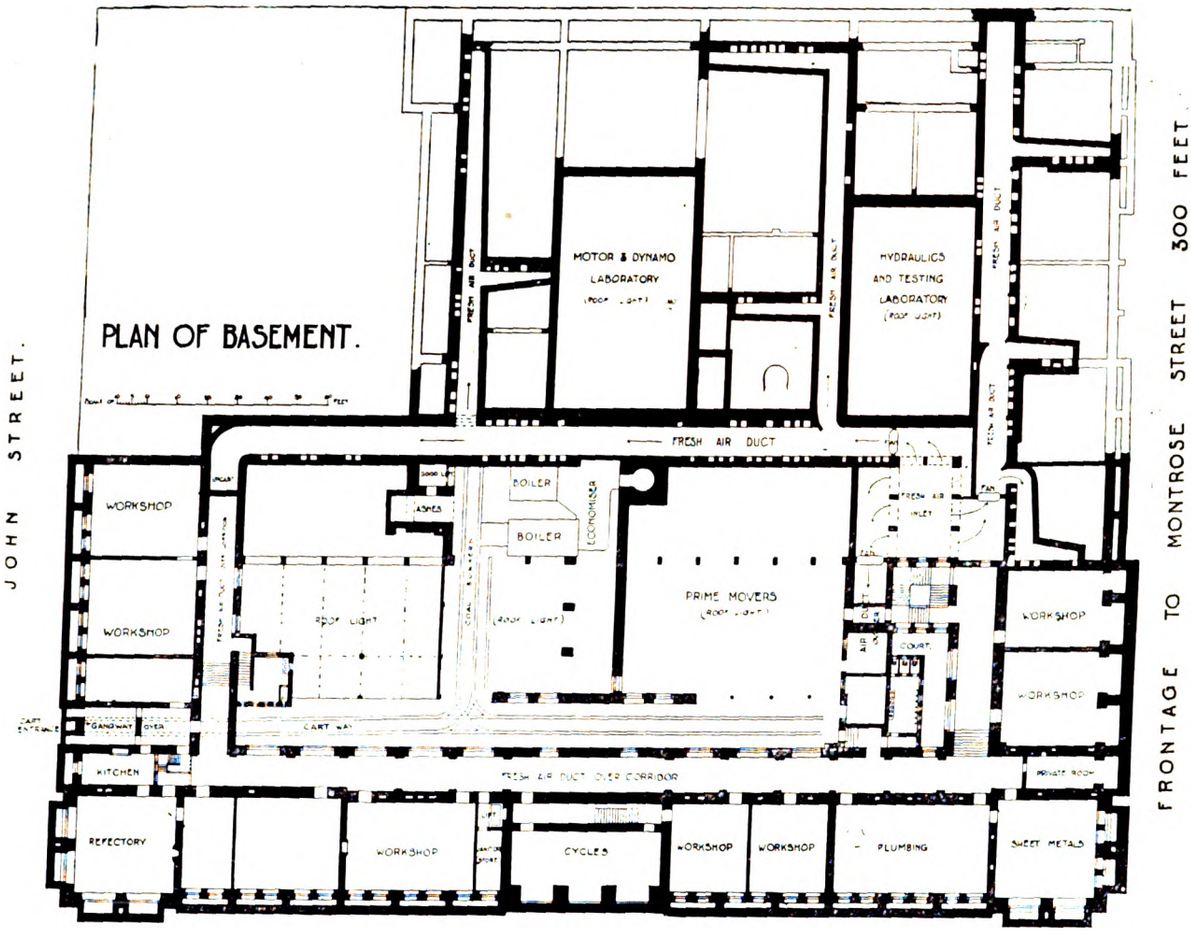
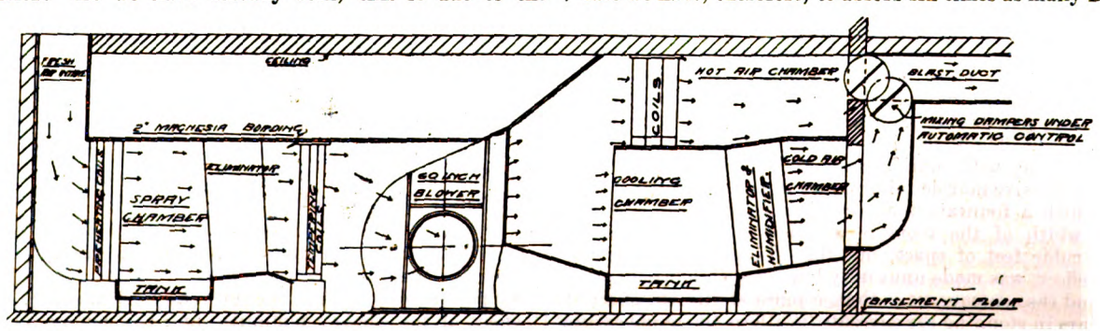


FIG. 66.—ARRANGEMENT OF MAIN AIR DUCTS AND FANS, GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.



[From *Ice and Refrigeration*.

FIG. 67.—AIR-COOLING ARRANGEMENTS AT THE AUDITORIUM HOTEL, CHICAGO.

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the quantity of tubing to be put into the coils through which the brine is circulated. This, calculating from previous experience, may be taken at 21,000 feet run of 1½-inch diameter pipe.

The cost of such a plant erected on site would be roughly as follows:—Compressor, atmospheric condenser, evaporator, brine and water circulating pumps, brine coils, 3,000*l*.

An alternative to the brine tubes would be a wet air cooler such as that shown in Article XII., which was installed at the Offenbach abattoir. The cost would in this way be materially reduced, but there would be the risk of carrying flecks of brine into the rooms when the plant is speeded up. At the maximum velocity in the ducts at Glasgow (16 feet per second) this might easily happen.

But in any case the cost of the plant relative to that of the building cannot be regarded as excessive. The ducts and fans are there in any case, and all that would be necessary besides the items quoted above would be an insulated chamber to contain the coils, costing probably 150*l*. This brings the total expense to some 3,150*l*., and for the building with equipment 350,000*l*. was raised in subscriptions. In such a case as this, too, the plant would serve as a most useful addition to the apparatus in the heat engine laboratory, and would obviate the necessity of putting in the small experimental plant usually found in these places.

In all public buildings, where the temperature warrants it, there is no doubt that a plant of this kind would be of great use. Such buildings are theatres, concert-halls, hotels, restaurants, large blocks of offices, private houses; and a crying example, surely, is our vaunted House of Commons. Everyone knows the discomforts which are endured by sitting members during the summer session, but although cold storage has been installed in the catering department, no movement has yet been made towards cooling the air supply for the House.

Many office blocks are heated by radiators in winter, and it has been suggested to use these radiators in summer for the circulation of cold brine. A larger surface would of course be necessary for cooling than for heating, as the temperature difference would be less than a third of what it is with steam, but that difficulty would be avoided by putting in extra radiators. The connections would also be extremely simple, as all that would be necessary would be to put in the pieces in the mains so that the circuit could be connected to the boiler or the brine tank according to season. Provision would at the same time be made for completely emptying the circuit before the change over. The expense, therefore, would be reduced considerably; but the scheme, unless economy is absolutely essential, cannot be recommended, as heating by radiators is beyond doubt most inefficient compared with a system such as that used at Glasgow. It is also, owing to the highly saturated state to which the air is brought, distinctly inferior from a hygienic standpoint.

But, in default of anything better, the arrangement is worthy of consideration. There are, in fact, many cases where the instalment of any other cooling system would be impossible or extremely difficult owing to the arrangement of the existing buildings, and certainly by using in the radiators much expense is saved.

One of the most notable examples of an air-cooling plant as applied to hotels is that at the Auditorium Hotel, Chicago (1,600 rooms), supposed to be the largest in the world. It is specially interesting owing to the fact that the largest room cooled, known as the Pompeian room, is practically open to the main corridor leading from the street entrance. It is also connected by wide openings to the neighbouring reception or "Elizabethan" room, which is not artificially cooled. The Pompeian room itself is constructed on a luxurious scale, with marble walls and marble ceiling, supported by massive marble pillars, and in the centre is a dome, under which a fountain plays continuously.

The width of the room is 150 feet and its capacity 269,750 cubic feet of space, but the ceiling, to produce the desired effect, was made unusually low for such a large apartment, and the consequence is that, combined with the effect of the pillars in stopping air currents, it allows the temperature to rise uncomfortably in summer. It was therefore decided to adopt for this and for the banqueting hall above a system of artificial cooling. The latter is 106 by 49 feet and 34 feet high, so that, taking in the smaller banqueting hall and the service room, the total space to be cooled amounts to 500,000 cubic feet.

This has to be maintained at 10 degrees below atmospheric temperature, and to carry out this duty a 100-ton (American unit = 2,000 lbs.) carbon dioxide compressor, driven by a 150 b.h.p. electric motor and fitted with an atmospheric condenser, was installed. As the plant runs continuously it was impossible to economise by putting in a smaller compressor and using brine to effect storage of "cold" as in the Cologne theatre. Consequently the pipes which cool the air form themselves the evaporator and allow direct expansion of the refrigerant coming from the condensers.

The pipes are contained in two cooling chambers, one for the Pompeian room and one for the banqueting hall, the diagrammatic arrangement of which is illustrated in fig. 67. For the Pompeian room 3,850 feet of 1½-inch piping have been provided, over which water from the city mains is sprayed at the rate of 200 gallons per minute. The air is thus efficiently cleansed, and at the same time the deposit of frost on the pipes is prevented.

The cooling chamber, 10 by 14 feet in area by 12 feet high, is divided into two sections. In the first of these (7 by 10 feet) the air passes over heating coils used in cold weather, then through a spray shower to give it a preliminary cleansing, and finally into the 60-inch blower, from which it is discharged into the second chamber, containing the expansion coils. In this chamber two alternative passages are provided for the air, one being a bye-pass to the cooling coils. The latter is fitted with heating tubes, to be used if necessary, and by means of the two dampers shown, which are automatically regulated by the thermostats in the Pompeian room, the air can be divided between the two according to the prevailing conditions. In both chambers humidifiers or eliminators, consisting of pans of calcium chloride, are provided to adjust the humidity. This substance, as we have seen, is hygroscopic, and by altering the quantity in the pans the humidity can be regulated at will.

From the exit of the chamber the air passes at the rate of 17,500 cubic feet per minute to the Pompeian room, being conveyed there by two ducts, 47 by 30 inches and 28 by 30 inches respectively in area. The ducts, which are made in galvanised iron and insulated with 2 inches of magnesia boarding, lead to openings in the walls of the room, which are covered by black iron registers provided with regulating dampers. An equal number of exhaust openings are provided near the ceiling, through which the air is sucked by a 90-inch blower and discharged to the atmosphere or returned to the cooler as desired. For the banqueting hall similar arrangements are made, and separate fans, cooling appliances, expansion coils, and ducts provided. All fans are driven by electric motors, the speed of which can be regulated to 25 per cent. overload and are of sufficient capacity to change the air in the rooms six times per hour on both blast and exhaust systems. Under these circumstances the air velocity in the ducts would be 20 feet per second and 5 feet per second at the discharge into the rooms.

The working of the plant has been uniformly successful. In fact, in actual practice the guarantee is more than fulfilled, as on the average the temperature in the Pompeian room is found to be 14° Fahr. less than that of the offices and corridors next to it.

By this example, therefore, and by the working of other plants which might be cited, it is demonstrated that the problem of cooling air supplies has been solved, but whether sufficient enterprise will be found in those controlling the public and other buildings of this country to secure the wider adoption of the system remains to be seen.

(*To be continued.*)

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

At the opening meeting of the present session held on October 20, the President, Mr. W. J. Hall, F.R.I.B.A., on entering his second year of office, delivered the usual presidential address. Naturally, he referred to the Housing and Town Planning Act, and pointed out that under its provisions the potential value of land to its owner might be reduced without redress if it appeared that this would be for the benefit of the community at large. He urged that the powers of the Act should really be exercised for the benefit of the whole community, and not merely for that of one class. As architects, he considered we must rejoice that some restraint could now be enforced upon the doings of the speculative cottage-house builder.

Mr. Hall spoke of the vitality of architecture as still a living art despite the tendency of modern commercialism, but warned his hearers that they must remember that they were living under different conditions to those that obtained 600 years ago, and therefore there was all the more room for originality in dealing with the needs of our present-day advanced civilisation.

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THE ARCHITECTURAL ASSOCIATION.

The President's Address.

(Concluded from last week.)

SO multifarious are our engagements here that it is impossible for time to be found for all; but I want to call attention especially to the course of five lectures on the arts associated with architecture that are to be given during this winter. Subjects such as stained glass, mural painting, and sculpture in its relation to buildings, can hardly fail to be useful to students; poor and incomplete is architecture without them, and as these lectures are to be given by well-known and able lecturers, I feel confident that they will be well attended.

Also important is the series of lectures on Town Planning. They are school lectures given by Mr. Raymond Unwin, but in view of the London Congress bearing on the subject it has been decided to throw them open to the general body of members and to interested non-members. The near future will see such great developments in the arrangement and rearrangement of towns and suburbs and villages that the subject is obviously one in which architects should be well grounded. The value of the art of town planning speaks for itself. It is painful to think of London's shortcomings and how few good buildings there are here, comparatively speaking, that can be really well seen. The Athenæum Club, the Alliance Assurance Offices, St. Martin's Church, the Royal Exchange, are a few that stand out in favourable contrast to the multitude of finely designed structures of whose existence one is scarcely aware; and the new buildings in the Strand illustrate the good effect gained by a well studied lay-out of new ground. Lost opportunities, however, abound in all directions. Think how grand must have been the effect of the steeple of St. Magnus Church when it stood over the actual footway of the old London Bridge approach, or what a fine view the spire of St. Bride's Church is as seen from Fleet Street at the end of the narrow turning that leads down to it, although even that view was greatly injured by closing it to some extent a few years ago; and then consider what a difference to the aspect of London would have been made if mere details of town planning such as these had received due attention in the past. Our squares are being ruined at the present time by new buildings utterly out of keeping with the old ones; the Marble Arch has been made ridiculous; wide streets are belittled by buildings far too high in proportion to them, and good skylines are spoilt by horrible erections towering up from the back of buildings, as if architectural design in cities were a matter of front elevation and nothing else. It is time that errors of this kind were checked, and if town planning is properly studied and followed up by architects public opinion will soon follow, and these matters will receive proper attention and proper control. I commend these lectures as a preliminary exercise in a most valuable study.

There are many more things that I might deal with—the Musical Society, the Athletic Club, the successes that our members have achieved in many places. With regard to the Athletic Club, I am glad to say that the long-discussed club ground is now an accomplished fact. Freehold ground at Elstree has been bought, and the necessary outlay on it has to be met with the help of all who can see their way to supporting such a praiseworthy effort. I might easily weary you with discussing the many subjects that occupy us; the main point is that from many directions, and in all sorts of ways, this Association is exerting a sound and lasting influence on the development of a great art in this country, and while it continues to be characterised by the harmony and enthusiasm that have distinguished it up to the present time we shall have no misgivings as to the future, and shall look back with no regret to the past.

MR. GERALD HORSLEY said it afforded him particular pleasure to propose a vote of thanks to the President, because he had known him nearly all his life. It was many years now since they used to sit side by side in the same office and work together, and go to the Academy schools and compete there for prizes. Mr. Keen had shown by his work the great love he had for architecture, and the real skill he possessed in its practice. Above all things, their President was an artist, and he had given the best of his powers and that of his interest to architecture. Had they been unacquainted with the fact, the very words of the address must show how deeply Mr. Keen realised his work as an artist in England, and how thoroughly he meant to carry out his part as an architect and to devote a great deal of his time to the work of the Association. One part of the address which interested him very much was where Mr. Keen advocated the study of Greek work, its influence, and methods of design. If they looked across the Channel they saw that the French had studied Greek work for many years. It was true that successful students, after their studies in France, went to Rome; but usually those students, when they were preparing their sets of drawings, travelled to Greece and studied some old temple. If the study of Greek work was successful in France it might be so here. The best of the French architecture was strongly tinged with Greek study, and the President perhaps had that in his mind when he made the suggestion that students in England should study Greek influence.

MR. G. E. NIELD seconded the motion, and said it was some twenty-four years since he joined the Association. Listening to the address, almost every sentence and paragraph drew his attention to the advantages derived in membership of the Association to-day compared with twenty-five years ago. In 1886 the Association met in some small rooms in Conduit Street, the library a large cupboard with not many books in it, and the librarian in early years was Mr. Mountford. The classes were more like pleasant evenings; there was not the serious work he saw going on in Tufton Street. He remembered, too, their present premises when they were held solely as a museum, with Professor Brown and Mr. Holgate as masters; and recalling the meagre accommodation of those days, and comparing it with the better arrangement of to-day, he thought the student had everything to be thankful for.

MR. W. MILLARD said the address contained many good texts, and he agreed with the President that the main test of design was fitness. No architecture was to be learnt as architectural design. Students should make themselves masters of all that was taught in the schools, and they would then find that they would be able to make their art adapt itself to their work.

MR. A. T. BOLTON said the address was interesting to him because to some extent it had gone over the discussions which were held in the office when times were slack; but he thought he detected in some respects some developments and changes in Mr. Keen's views. That was particularly so in reference to the work done in the first quarter of the last century, when he spoke of Burton and the breadth and dignity of Barry's work, and the capacity and refinement of Cockerell's. They must remember that those architects nearly all made extensive tours, and possessed a general education which in many ways was really remarkable. He was reminded by this reference to the Greek revival that one of the early buildings of Sir Charles Barry appeared to be in some danger of demolition. He referred to the Museum at Manchester. In a revival of Greek influence he was not at all sure that difficulties would not arise, for they would remember how Sir Charles Barry abandoned the Greek and developed an Italian style. Students were not to be misled by the text-books in their study of Greek work. They too often thought they contained the whole of Greek architecture, whereas all the domestic work had perished. Godwin and a few others had an instinctive knowledge of it, but Greek work remaining was essentially fragmentary, and students must therefore consider it in an exceedingly large way. He advised students not to tie themselves down to what were considered good examples, but to enlarge upon the knowledge gained from them. Mr. Keen had drawn attention to the real earnestness of the work of the Gothic revival, and that of Mr. Butterfield in particular, and his wonderful way of arriving at what he tried to do. The speaker said he had seen Truro Cathedral a short while ago, and he thought Mr. Pearson had secured success in that building; and in the case of Mr. Pearson there was never a more unassuming man, and his knowledge was of a profound character. The greater the difficulty, the greater seemed his success; and when the thing was easy it almost lacked interest. He knew, of course, Mr. Keen's reverence for Ruskin. There was one remark of Ruskin's which seemed remarkably true. He spoke somewhere of the eminently political art of architecture. There was a lot of sound sense in that remark, because there was a likeness between the conduct of politics and architecture; for the latter, like politics, was largely a matter of compromise.

The vote of thanks was passed by acclamation.

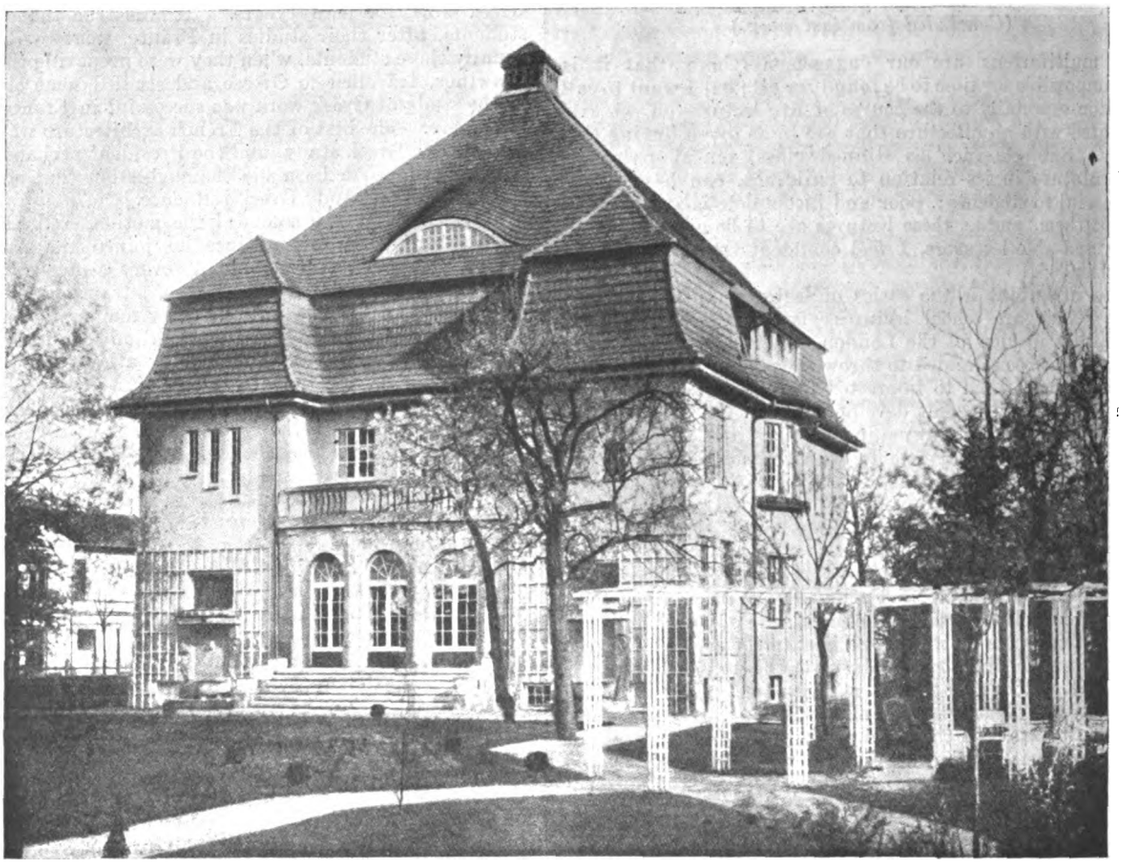
The President briefly replied, and the meeting terminated.

An ordinary general meeting of the Architectural Association was held on Monday, the 24th inst., at Tufton Street, S.W., Mr. Arthur Keen, President, in the chair.

The PRESIDENT having read out the names of a large number of candidates for membership, they were elected unanimously. Mr. Clapham proposed the adoption of the

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Moderne Bauformen.*

HERR HERMANN SAGER'S HOUSE, NEUMUNSTER-KIEL.—Herr Hans Ross, Architect.

Council's report and balance-sheet for session 1909-10. This was agreed to. A meeting of the Camera, Sketch, and Debate Club was announced for November 3, when a paper entitled "Plastering and Modelling," with demonstrations, will be read by Mr. Laurence Turner.

Mr. Edwin Gunn then read a paper, of which we give an abstract, on

The A. A. Excursion to York and District, 1910.

In selecting Harrogate as the centre for this year's excursion the Committee were actuated by no desire that members should avail themselves of the "cure." Harrogate is not an interesting place. Its choice as a lodging was made chiefly on account of its position at the focus of radiating lines of railway, and it was studiously neglected by all the excursionists.

Yorkshire had not previously been visited by the Architectural Association, and the selection of a northern centre did not attract a very large attendance, possibly owing to the long railway journey from town. An excellent week was spent, however, when the members of the party had learnt the peculiarities of the local weather. The buildings seen were well worthy of study, though the lack of the unexpected in the shape of simple roadside domestic work of really spontaneous architectural character was felt by members accustomed to the southern counties. The local building material is, of course, stone; and many excellent weathering varieties, both of freestone and rubble, are in use. Roofs are covered with stone slabs, not at all resembling the Gloucestershire or Northamptonshire "stone tiles," but much larger, thicker, more regular in shape, and, owing to their weight, habitually laid to a flatter pitch. In the Vale of York a rather dull red brick, lacking the texture of the Home Counties' sand-faced brick, is the staple material, and roofs are usually of pantiles. Both these materials, however, invade one another's territory, and in the stone district pantiles are almost more common than roofing slabs.

The buildings visited on the excursion lay in three clumps—a thick cluster at York and more scattered groups around Ripon and Leeds.

York still boasts itself the second city of England, with a history that loses itself in the mists of the past. It played an important part in Roman Britain.

Of Roman remains above ground York can show but few; it has been continually a live city, and has accordingly been burnt, destroyed, and rebuilt wholly or partially many times, the Roman buildings doubtless serving as quarries for later erections.

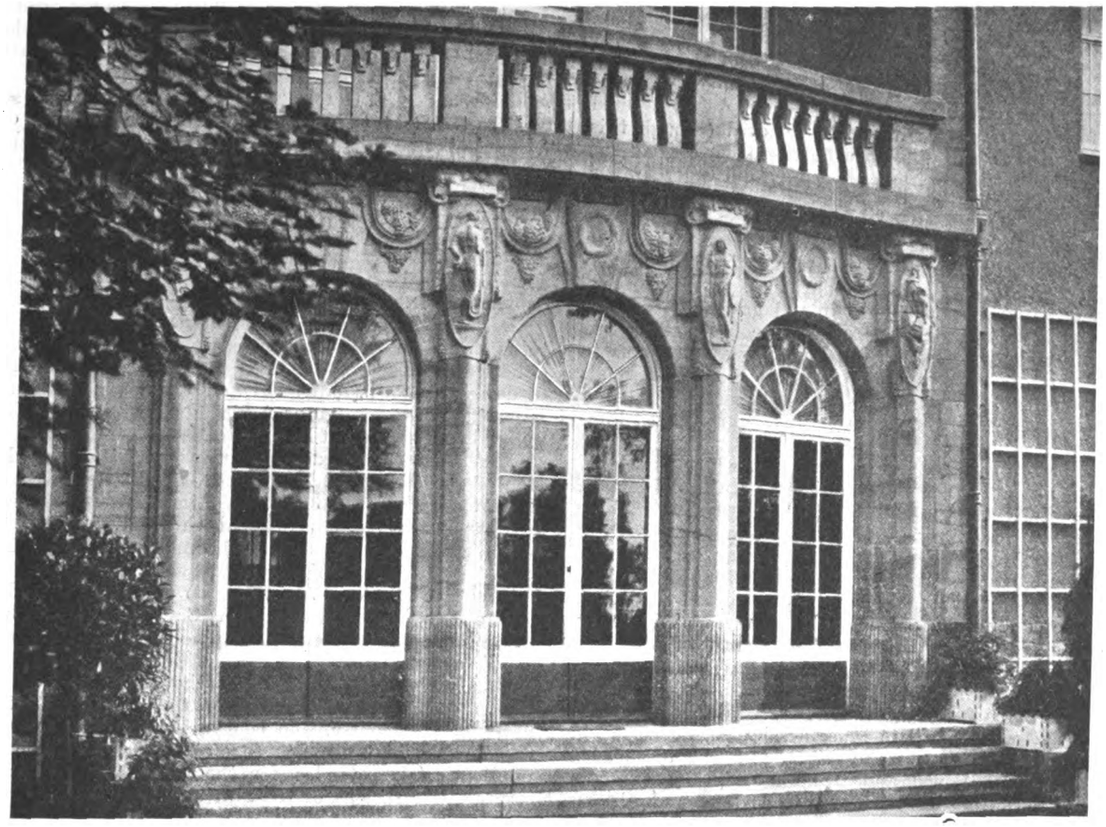
York contains a considerable amount of Norman work, the most visible being the lower portion of Bootham Bar, but the most noteworthy the remains of the crypt at the Minster, the chief part of which was discovered as a consequence of the fire of 1829. The thirteenth-century work of York, with the single exception of the north transept front containing the famous "five sisters," displays great lack of architectural grip, though beautiful detail abounds. The design of each nave bay is good in itself, but there is somehow in the whole effect a general tameness and lack of emphasis. The best work of the fourteenth century at York is the chapter house, and more particularly the lofty passage or vestibule which connects it with the north transept. The Minster escaped serious damage during the Civil War, due to the good offices of Fairfax, to whom we owe the preservation of the finest collection of painted glass in the kingdom. The glass of York requires a Paper by itself and cannot be even slightly dealt with now.

The Edwardian walls are perfect all round the city, but built and repaired at so many different periods that very little ancient work can be definitely made out. The gates or bars, however, all show good Decorated work of military character, though only one—Walmgate Bar—retains its barbican, which was in the case rebuilt in 1648. In the other gates the doorways leading formerly to the battlements of the barbicans now remain "skied" above ground. One of the finest of the lesser mediæval buildings is St. Anthony's Hall, founded by Sir John Langton, Mayor of York, about 1440, for Brethren of the Mendicant Order of St. Anthony. It consists of a noble hall entirely of timber construction, covered by a steep open roof with five very fine arched trusses, and three tie-beam trusses at the west end. On either side are aisles covered by flatter-

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MODERN EUROPEAN ARCHITECTURE.

GERMANY.



[From *Moderne Bauformen.*

DETAIL OF ENTRANCE, HERR HERMANN SAGER'S HOUSE, NEUMUNSTER-KIEL.—Herr Hans Ross, Architect.

pitched lean-tos, with arched braces, the principal rafters of which thrust their inner ends into the "nave," where they appear as diminutive hammer beams. The building is now divided by modern floors and partitions to serve as the Bluecoat School. Another interesting building is St. William's College, which is under restoration by Mr. Temple Moore, to serve as a Convocation House, and is being well treated. Like all mediæval towns, York had its trade guilds, and the continued existence of two of these in their original buildings (though shorn of their powers) gives an old-world flavour. These are the Merchant Taylors and the Merchant Adventurers, and though their halls do not now present any strikingly noteworthy architectural features, they are of the type which we would not willingly suffer to pass.

The rather nondescript styles of the Early Renaissance are represented in York by the King's Manor and Treasurer's House, as well as by portions of the buildings of St. William's College. The King's Manor is mainly Jacobean in character and very picturesque. The north wing was erected by the Earl of Hastings in the reign of Elizabeth, the entrance front and east side of the quadrangle by the Earl of Sheffield in 1603-19, and further portions by Viscount Wentworth (afterwards Earl of Strafford), whose arms appear above a doorway in the quadrangle. The house is now occupied by the Yorkshire School for the Blind. Treasurer's House stands on the north side of the Minster, opposite the chapter house, and though its core is mediæval and even older, externally the house is Jacobean. The house has had many owners, most of whom apparently left their mark upon it by some alteration. The most important results were the refronting and division of the mediæval hall by a floor (both assumed to be due to Sir George Young, about 1620), and the redecoration of the interior with panelling and new staircases, by Mr. Squire, between 1698 and 1700. The north front remains practically unaltered—a pleasing piece of brickwork. The house was restored for the present owner, Mr. Frank Green, in 1897, and now houses a fine collection of period furniture in the various living rooms. Mr. Temple Moore's work is not the least interesting in the house, his new entrance from Chapterhouse Street being a very delightful composition indeed.

The later Renaissance in York would apparently prove an interesting field for study. Numerous quietly satisfying brick fronts, with the usual appurtenances of wrought-iron railings, lead rainwater heads, and sturdy sashes give promise of good, simple panelled interiors. We were only able to inspect one or two of these buildings. Probably the earliest of these was the Queen's Hotel, said to have been a town house of the Duke of Sutherland until about fifty years back. The exterior is not exciting, and scarcely prepares one for the excellent detail of the chief room on the first floor. In the later eighteenth century York boasted a local architect of some eminence in the person of Carr, who was twice Mayor of the city. It was perhaps the knowledge that Carr started as a working mason which caused the discovery that most of his work in York is executed in brick to be something of a surprise. Castlegate House, formerly the home of the Vavasours, and now in the occupation of a club, is a very good example. The interior contains some detail rather more than ordinarily sumptuous. The plaster work is exceptionally rich, the ornament being rather French in character. A good stone stair with wrought-iron balustrade leads to the first floor and is lighted by a Venetian window with marble columns.

The whereabouts of Leeds is distinguishable from many miles distance by reason of the layer of "atmosphere" which hangs above it. It was visited by the excursion with the object of seeing St. John's Church, which proved well worth while; but that duty accomplished, no one felt inclined to linger. There is literally nothing to compare with this building which John Harrison founded and finished. The church of St. Catherine Cree in London is near by in date, and its structure displays a similar fusion of Gothic and Classic details, while the fifteenth-century church of Croscombe in Somerset has perhaps an equally fine collection of Jacobean woodwork, but here the whole, both structure and fittings, is contemporary, and, considering its vicissitudes, marvellously perfect. The building consists of two parallel naves united by an arcade of seven pointed arches upon piers with octagonal caps moulded with Classic profiles

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and with egg and tongue and acanthus enrichment. The arrangement of the seating now follows the traditional form, but as originally planned the church had axes running in two directions, of which the cross axis at right angles to the nave was the more important. This arrangement persisted until about fifty years ago, when the church was restored by Mr. Norman Shaw, who rearranged the seating. The pews were cut down 6 inches, and their doors unfortunately lost, the pulpit moved nearer the screen, lowered about 2 feet, and its sounding-board removed (though this has since been replaced), the cresting taken down from the screen and sold to a Leeds manufacturer, and other drastic alterations made. In the last restoration by Mr. Temple Moore some of these disturbances have been made good, especially notable being the recovery and replacement of the cresting above the chancel screen and the replastering of the walls. The presence of so much dark oak furniture, and the judicious introduction of colour and gilding in enrichments, give a most sumptuous air to the building. It is not great architecture, but rather building which seems to convey a charm which can only be described as personal. Professor Blomfield fitly describes it as the product of a happy-go-lucky system wherein each craftsman pleased himself within the limits of his own work.

It was amusing to see the avidity with which sketchers, measurers, and photographers attacked Austhorpe Hall, which was distinctly the success of the excursion. Above the entrance appears the date 1694, with a monogram which was variously interpreted by several members; local inquiry eventually elicited the correct answer as "John More." The house is particularly valuable owing to its perfect condition. It has suffered but one outrage—the removal of its main staircase—and, judging from the fine detail of the back stairs, this is a great loss. The rooms are all panelled with fine bold panelling and most excellent mouldings, which are in a fine condition for study, since in several cases they are of clean oak, with contours undulled by paint. The old lock furniture remains on the doors, and the old leaded glazing in the mullioned and transom casement windows. Several of the ceilings are divided into bold coffers by beams with plaster mouldings and soffits, the room at the right of the Hall having also modelled leaves in the angles. The simple but wholly satisfying means by which the external design attains its effect of dignity and restraint are very instructive; practically the front is a play upon quoins of varying depths. The absence of absolute symmetry is also interesting.

(To be concluded.)

GLASGOW INSTITUTE OF ARCHITECTS.

At the recent quarterly meeting the Secretary submitted a report on the matters which had been dealt with by the Council since the last general meeting; 7*l.* 7*s.* had been granted to the Glasgow School of Architecture for prizes, and the proportion of these prizes, amounting to 2*l.* 2*s.*, granted to the Technical College section of the School of Architecture, had been awarded to James M'L. Brown, Green Street, Stonehouse. The alterations to the roof of Glasgow Cathedral had engaged the attention of the Council, and they had expressed their approval of the manner in which the alterations had been carried out. It has been arranged with Mr. Oldrieve, H.M. architect, who had charge of the alterations, to give a paper on the subject of the cathedral roof before the Institute in January or February next. It was also announced that the President had arranged with Mr. J. A. Gotch, of Kettering, and Mr. A. W. S. Cross, M.A., London, to give papers before the Institute in the course of the coming session.

OUR CONTEMPORARIES FROM OVER-SEAS.

The *American Architect* (New York) has in recent numbers illustrated the chapel of the United States Military Academy at West Point, a fine piece of impressive modern Gothic, of which Messrs. Cram, Goodhue & Ferguson are the architects; the successful competitive designs for Homes of the Grand Lodge of Free and Accepted Masons in Pennsylvania, an institution to accommodate about 700 persons; and the New York Improvement and Tunnel Extension of the Pennsylvania Railroad, by Messrs. McKim, Mead & White. In the issue of September 28 appeared Professor Goodyear's analysis of the report of the Pisa Commission on the Leaning Tower, of which an abstract has already appeared in *The Architect* of October 7.

La Construction Moderne (Paris) has given some good illustrations of the architecture of the Brussels Exhibition, of one of the important new buildings recently erected at the Champ-de-Mars, Paris, and of a bathing establishment at Chatel-Guyon, in Puy-de-Dôme. In the series of articles on Old Paris, accounts have been given of L'Hôtel de la Vieuville and of L'Hôtel d'Albret.

Der Architekt (Vienna) illustrates the building of the "Urania" music-hall at Vienna, two competition designs for the Austrian country house at the Rome Exhibition of next year, a town house at Prague, and two cemetery monuments, all "new art."

Arkitektur og Dekorativ Kunst (Christiania) gives a full account, with plans, sections, and elevations, of the new Technical High School at Christiania, opened on September 15.

Berliner Architekturwelt (Berlin), like a haggis, contains a deal of fine confused eating, and, if possessing no outstanding feature, has this month many excellent bits of design on both traditional and "new-bau" lines. Perhaps the most important building illustrated is the new police headquarters at Charlottenburg, Berlin.

Het Huis (Amsterdam) contains an illustrated description of the church at Nieuwstadt, an article on the collection of seals in the archives of Limburg dating from 1100 to 1806, and another on the church of St. Martin at Bolsward, the glory of which is the marvellous early Renaissance pulpit and late Gothic choir stalls.

Moderne Bauformen (Stuttgart) is chiefly devoted to the work of two firms of architects at Carlsruhe, Curjel & Moser and Pfeiffer & Grossman, both able exponents of the "new-bau" movement at its best.

Deutschland (Düsseldorf) is the official journal of the Union of German Societies for the Promotion of International Intercourse, and contains a valedictory article on the Town Planning Exhibition at Berlin. Although the publication is intended for the general public, there are several illustrations of German architecture, both new and old, principally from Düsseldorf and Cologne.

The *Architectural Record* (New York) issues a country-house number, which gives an excellent impression of modern American architecture in the domain of domestic work. All types of country houses are represented, and also several examples of garden architecture.

Construction (Toronto) has this month for its principal features a fully illustrated article on Lincoln Cathedral, and another on the Liberty Tower, New York. An interesting account is given of the rather remarkable house recently erected in the primeval forest of Northern California for Mrs. Phœbe Hearst, and designed by Messrs. Maybeck & White.

Engineering Record (New York) contains the report of a committee of the National Association of Cement Users on the exterior treatment of concrete surfaces, in which the subject is very fully treated.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Fellows of the Surveyors' Institution.

Sir,—May I be permitted to take advantage of your pages to warn members of the surveying and allied professions against giving pecuniary assistance to persons unknown to them, who describe themselves as Fellows of the Surveyors' Institution? Such applicants should be referred to the Benevolent Fund of the Institution, 13 Great George Street, S.W., which has been established for the purpose of relieving authenticated cases of distress among members or their families.

My apology for troubling you with this letter must be that several cases have come to my knowledge where members of the Institution have been victimised.—I am, Sir, your obedient servant,

A. Goddard, Secretary.

12 Great George Street, Westminster: October 20, 1910.

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The Architect.

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FORTHCOMING EVENTS.

Monday, November 7.

Royal Institute of British Architects : Opening Meeting; Presentation to Mr. John W. Simpson, Secretary-General of the Town Planning Conference; Address by Mr. Leonard Stokes, President, and Exhibition of Drawings representative of works of Royal Gold Medallists, 1842-1910.

Society of Engineers : Mr. S. M. Dodington on "Public Slaughter Houses."

Tuesday, November 8.

Institution of Civil Engineers : Mr. G. W. Humphreys on "The L.C.C. Holborn to Strand Improvement and Tramway Subway."

Illuminating Engineering Society : Mr. F. W. Goodenough on "Recent Advances in and the Present Status of Gas-Lighting."

Guild of Architects' Assistants : Mr. J. V. Hibbert on "The Problem of the Architect's Assistant."

Thursday, November 10.

University College, London : Mr. J. A. Gotch on English Domestic Work; Lecture (3) on "The Coming of the Italian Influence."

Friday, November 11.

University College, London : Professor F. J. Haverfield on "Greek and Roman Town Planning."

ROMANESQUE ARCHITECTURE.—II.

IN studying the earlier basilicas it is interesting to note the difference between the method that obtained of roofing the naves in some of the Syrian examples from that employed in the West. In Dr. RUSSELL STURGIS's second volume of his "History of Architecture"* this is well explained with reference to the buildings at Shakka, Tafha, and Kanawat, in Syria, in which the naves are roofed with transverse arches from pier to pier, kept so close together that a stone slab may span the distance between them, as opposed to the Western method of a continuous wall running the length of the nave and supporting a timber or vaulted roof. It is rather curious that in Burgundy the method of roofing the nave by transverse arches with barrel vaults springing from them, as at Tournus, is also found.

The age of the Tafha group of buildings is fixed by Dr. STURGIS at, approximately, near the close of the seventh century; but at that time basilicas of the more usual type were in process of construction. Of these several examples are quoted by Dr. STURGIS, including the great church of St. Simeon Stylites at Kalat Siman, Syria, with its remarkable arrangement of four separate basilicas abutting upon the open octagonal court, in the centre of which stood the pillar upon the top of which ST. SIMEON spent his latest years, until his death in 460 A.D.

The value of the study of the Syrian churches lies in the fact that they help to bridge the centuries from 450 to 900 A.D., which, west of the Adriatic, were passed in poor living and hard fighting, with nothing but makeshift buildings to represent the art of architecture.

Romanesque architecture in Syria also is of high value during this period because it is more clearly a logical development from Roman classic architecture than one might suppose to have occurred if we merely jumped from the times of the later Roman Empire to the eleventh century. The sixth-century builders in Syria had definitely adopted the starting of the archivolt from free columns which signalised the extinction of the order and the exaltation of the arch. Hence in anything like a rational history of architecture, such as Dr. STURGIS has given us, the study of Syrian examples must play a vital part in any explanation of the development of Romanesque architecture.

In Palestine we have the very interesting plan of the basilica of St. Mary at Bethlehem, called also the Church of the Nativity, which, built in the time of CONSTANTINE and repaired under JUSTINIAN, is shown by DE VOGÜÉ as a five-aisled basilica with triaxial apses to chancel and transepts, thus forming the precedent for the usual plan of Rhenish churches in the German development of Romanesque many centuries later. The large atrium shown by DE VOGÜÉ is stated by Dr. STURGIS to have been erected in the time of JUSTINIAN. Thus we have here from the East a typical basilican church with narthex and atrium.

Another by-path of Romanesque architecture that must not be overlooked is the treatment exhibited in the Coptic churches of Egypt. In these Dr. STURGIS tells us that the orientation is that of Europe, the altar at the east end, and a cupola is commonly found above the place reserved for the altar; this in most cases being the only cupola, and thus presenting a type of plan quite distinct from the Byzantine system of a central dome or the Franco-Byzantine plan of a series of domes.

Dr. STURGIS refers to the use in the early Coptic churches of the pointed arch for the nave arcades, these being commonly carried by classical columns of miscellaneous sizes and styles with a heavy timber epistyle. From these Coptic churches, we are told, the use of the pointed arch passed into the earliest forms of the mosque, as seen in that of Ibn Tulun.

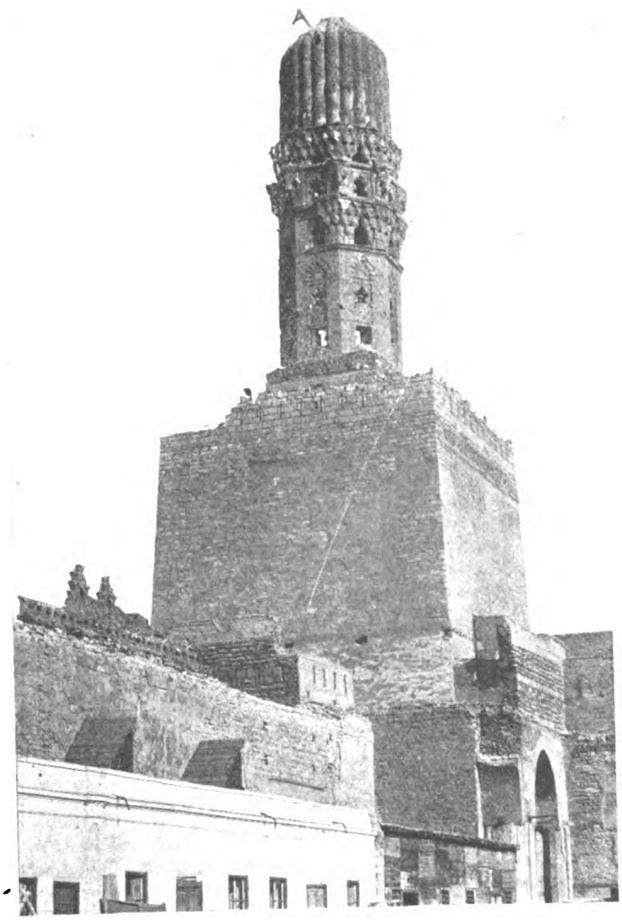
The greater basilican churches of the earlier period in Rome will, of course, receive due attention from the student of Romanesque architecture—St. Peter's, St. Paul without the walls, St. John Lateran; but it is more particularly in the smaller examples that we see the use of incongruous collections of pilfered columns from classical buildings, as in Sta Agnese beyond the walls, San Giorgio in Velatro, and Sta Maria in Cosmedin.

In his treatment of the churches of radiate plan or central area Dr. STURGIS appears to have given great weight to the idea that the plan of the Church of the Holy Sepulchre at Jerusalem is of high traditional importance. He, however, cannot get away from the fact that the churches of this type are almost entirely of early date, and that they soon became of secondary importance, and in many instances were turned into baptisteries, for which use, as we pointed out in a former article, their form was peculiarly appropriate. Whilst our author claims that in the South and East the influence of the church at Jerusalem was felt more immediately, and that many buildings are evidently copies of it, he hedges very neatly by admitting that, on the other hand, the same tendency which led to its construction in a round form prevailed with the builders of other churches in Syria and in the lands of the Mediterranean. We still hold to the opinion that the central area plan only found favour as long as the rite of baptism was more important in the Liturgy than the sacrament of the Eucharist.

We note that Dr. STURGIS is one of the very few authors, if not the only one, of a history of architecture

* *A History of Architecture.* By Russell Sturgis, A.M., Ph.D., Vol. II. Romanesque and Oriental. (New York: The Baker and Taylor Company; London: B. T. Batsford. 25*s.* net.)

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MINARET OF MOSQUE EL-HAKIM, CAIRO.

who has given evidence of knowledge of the fact that there are five round churches in England of twelfth-century date, most writers ignoring that in Ludlow Castle.

Dr. STURGIS does not attempt to solve the puzzle of San Stefano, Rotondo, but contents himself with quoting some of the theories that have been advanced as to its original form and the reason for the different treatments that have been advanced in speculation. In fact, generally Dr. STURGIS is more given to record than to reason.

NOTES AND COMMENTS.

WE are glad to note that the National Housing and Town Planning Council realises the importance of sustaining the interest in town planning that has been aroused by the recent Conference, and that the Committee of the Council are now contemplating the arrangement of a series of district conferences and lantern lectures, with a view to establishing in great centres—including London—committees with the definite aim of securing that the clauses of the new Housing and Town Planning Act shall be wisely administered.

As we said last week, the good work that has been done by the R.I.B.A. in organising the Conference and Exhibition must not be allowed to fade away as a nine days' wonder, and the proposal of the National Housing and Town Planning Council to multiply conferences and illustrated popular lectures is an eminently practical first step in the maintenance and still further development of public interest in town planning. The idea of local committees is also a good one, where the right people can be found to compose them, but every such committee must have at least one member who is able and enthusiastic, a tactful and skilful organiser, in order that good may result.

IT may probably in many instances be a wise plan to utilise the existing parochial and congregational organisations of churches and chapels, literary and mutual improvement societies, and even—with a certain amount of caution—ratepayers' associations and political organisations. We advise caution in respect of these last because they are, very generally, allied to the political party system of our national life, and it would be fatal to any real progress in the improvement of either housing or town planning for any question of party to be mixed up with it. The great principle which should be impressed upon the British public at large is that improvements in housing and town planning are for the benefit of the whole community, and not for the advantage of any one class at the expense of another. A good town plan does not fleece the land-owner for the benefit of the working-man. A well-managed garden suburb is a good investment for the capitalist, at the same time that it enhances the amenities of life for the tenant.

THE London County Council is now engaged upon a town planning or clearance scheme, of which the total estimated capital expenditure, 473,300*l.*, is larger than the cost of any clearance scheme yet undertaken by the Council or the late Metropolitan Board of Works, but this scheme provides for the clearance of some of the worst rookeries now remaining in the County of London, Tabard Street and Grotto Place areas, Southwark, and Crosby Road area, Bermondsey. These areas comprise some sixteen acres, on which are crowded no less than 875 houses, or, more truly, hovels, worn out, dilapidated, and damp, so that it is no wonder that the death rate is more than twice that of the whole of London.

THE Housing of the Working Classes Committee of the Council has proposed to clear the sixteen acres, to utilise about five and a half acres for commercial purposes, to erect dwellings for 2,450 persons, and to devote about five acres to a public open space, on which would look the housing accommodation for 2,450 provided in five-storey balcony block dwellings.

As the number of persons to be displaced from the overcrowded area is 4,552, the possibility of the scheme depends upon the willingness of the Local Government Board to recognise that the Council has complied with the provisions of the Housing of the Working Classes Acts by the erection of accommodation for 19,500 persons in various parts of London and the suburbs, and is extending that accommodation in the further building schemes now being carried out on the White Hart Lane, Totterdown Fields, Norbury, and Old Oak estates.

THE Guild of Architects' Assistants has arranged a series of monthly meetings, at which papers will be read and discussion ensue on topics that in some cases might at first blush be considered to be of more interest to architects in independent practice than to their assistants, but it must be remembered that, if we understand the position rightly, the *raison d'être* of the Guild is that there is now a tendency towards the existence of a class of professional men who, although adequately trained in performing the ordinary work of an architect, are, for various reasons, social or otherwise, unlikely to leave the ranks of assistants for those of independent practitioners. Hence such subjects as "The Relationship of the Quantity Surveyor to the Architect." "Art and Registration," "The Town Planning Agitation" need not necessarily be considered beyond the scope of the Guild. Anyway, the holding of meetings at regular periods is a good element in promoting the fraternisation and camaraderie of members of the Guild, which are essential to its success and utility.

THE Christmas number of *The Art Journal* is a monograph on the later and riper work of Sir LAWRENCE ALMA-TADEMA, and hence is of particular interest to architects, for no one of our day has given more reality to our conception of the architecture of classic Rome and the

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life of which it formed a part than has ALMA-TADEMA. Latin may be a dead language, the buildings delineated by TAYLOR and CRESY may be the skeletons of a dead art, but ALMA-TADEMA has clothed these remains with flesh and imbued them with life, and we learn more of the real feeling of Roman architecture from his pictures than from all the measured drawings of numberless students, from the engravings of PIRANESI, or the *restaurations* of the holders of the Prix de Rome. The present number of *The Art Journal* has the added attraction that it contains reproductions of the excellent portraits by ALMA-TADEMA of two past-presidents of the Royal Institute, ALFRED WATERHOUSE and GEORGE AITCHISON.

THE *Inventory of the Historical Monuments in Hertfordshire*,* prepared by the Royal Commission on Historical Monuments (England), is an earnest of the excellent results that may be reasonably expected from the work of this Commission, and fully justifies not only the appointment of such a Commission, but the selection of the particular members appointed. No student or lover of the antiquities of our country, whether artistic or archæological, can be otherwise than delighted with the wealth of carefully garnered information that has here been collected and collated, all the more interesting for the beautiful illustrations included.

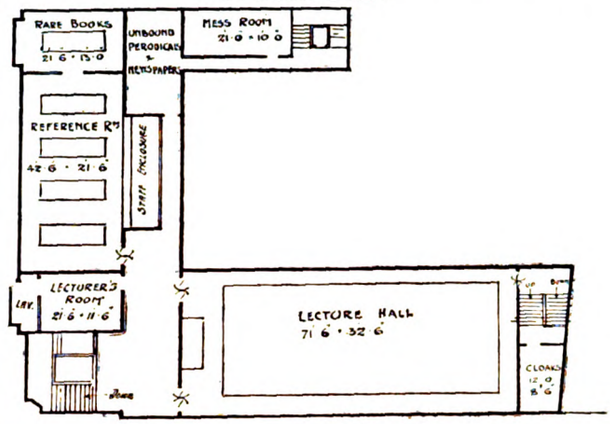
AN admirable historical introduction gives not only a *précis* of the history of the county of Hertford, but useful instruction to the novice in antiquarian lore, and much information that is of value to the student of architecture. The inventory Schedule A is arranged under the heads of parishes, the particular historical monuments in each of which are described in an approximately chronological sequence of categories, prehistoric, Roman, ecclesiastical, secular, unclassified. A second inventory, Schedule B, gives a list of monuments selected by the Commission as especially worthy of preservation. For the novice there is a remarkably complete and useful glossary of the meanings attached to the technical terms used in the Inventory. There is an invaluable index, in which the references are both topographical and topical, so that one can readily find where the description of either a parish or a monument is to be found. We must not omit to say that the term "historical monument" is used in a wide sense, a brass, a chalice, or a fragment of stained glass is as much included in the Inventory as a pre-historic earthwork or a Roman camp.

WE have received from the Duchess of SUTHERLAND a portfolio of photographic illustrations of artistic metal work manufactured (in the literal sense of the word) by the Cripples' Guild of Handicrafts, established by Her Grace. Many of the objects shown are reproductions or adaptations from old work of various dates, others are of good modern design. The photographs show skilful craftsmanship without being carried to that unwise high development of the modern skilled artisan, who seems to try how nearly his handiwork can approach the rigid and soulless perfection of a machine. There is no doubt about the work produced by the Cripples' Guild of Handicraft being hand-wrought. Architects might do worse than have their designs for metal-work carried out by the Guild, and thus assist in benefiting an unfortunate section of the community, whilst obtaining good results for their clients.

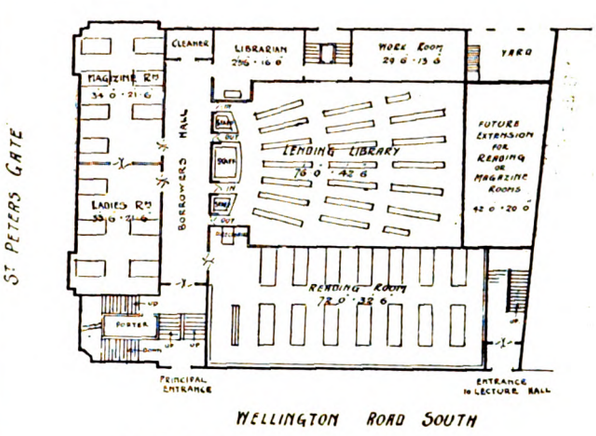
The Antiquary for this month contains an article of architectural interest by Mr. J. HARRIS STONE on the leaning pillars of the Collegiate Church of Santa Maria de Sar, Santiago, Spain, which building, if not so important as the famous cathedral, the pride of Galicia, is amongst the curiosities of architecture for the remarkable inclination outwards of its nave arcades. We have always considered that Professor ELADO OVIEDO ARCE, of the Santiago University, is right in attributing this divergence from normality to defective foundations, although his predecessor in the Chair of Archæology, Professor LOPEZ FERREIRO, held an opposite opinion. Mr. STONE, when writing his article, had apparently not seen Professor GOODYEAR's criticism on the findings of the Commission that investigated the alleged leaning of the tower at Pisa, to which allusion is made in the article.

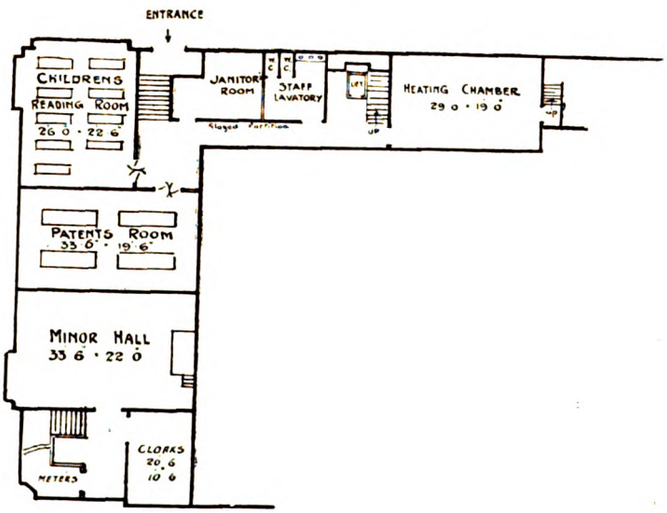
* *Royal Commission on Historical Monuments (England): An Inventory of the Historical Monuments in Hertfordshire.* (London: Wyman & Sons. Edinburgh: Oliver & Boyd. Dublin: E. Ponsonby, Ltd. 11*s.* 6*d.*)

COMPETITION FOR CARNEGIE LIBRARY, STOCKPORT.



FIRST FLOOR PLAN





BASEMENT PLAN

FIRST PREMIATED DESIGN.—By Messrs. BRADSHAW & GASS

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THE insistence of the Board of Trade on the advantage to Britishers of participation in foreign exhibitions is not without concern for architects. Some of our architects have reaped good results from publicity abroad, and there is an opening for further endeavours. We have been struck by the number of buildings, for example, that have been designed by French and German architects for the Argentine, and the few that have come from the boards of British architects. Our advice, therefore, is that architects in this country should take every opportunity that is open to them of being represented at foreign exhibitions.

ENGLISH DOMESTIC WORK.

ON Thursday of last week Mr. J. A. Gotch, F.R.I.B.A., gave the first of a series of eight public lectures on "English Domestic Work" at the University College, Gower Street, W.C. The lectures are in connection with the classes and lectures held at the expense of the Carpenters' Company. The complete course which Mr. Gotch is giving is as follows:—(1) October 27, "Keeps and Fortified Manor Houses"; (2) November 3, "The Later Mediæval House"; (3) November 10, "The Coming of the Italian Influence"; (4) November 17, "The Homes of Queen Elizabeth's Courtiers: Exteriors"; (5) November 24, "Ditto: Interiors"; (6) December 1, "The Drawings of Jacobean House Designers"; (7) December 8, "Inigo Jones and His Successors"; and (8) December 15, "Eighteenth-century Homes." The lectures, which will be illustrated by lantern slides, are intended primarily for architectural students, but are open to others without fee.

The first lecture dealt with

Keeps and Fortified Manor Houses.

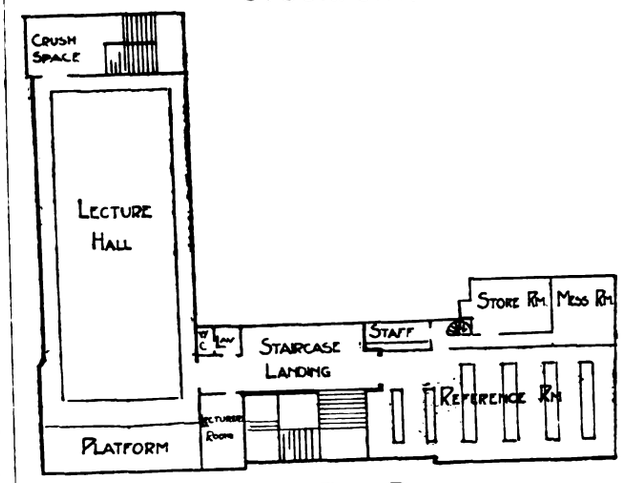
In giving an account of the vernacular work of the country Mr. Gotch said he hoped not only to show many illustrations of the manner in which that work was executed in different districts through some seven centuries, not only to give an idea of the changes that took place in the appearance of English homes, but also to show how the house has grown from very small beginnings to the comparatively comfortable habitations of the present day. The size of a house to-day is roughly gauged by the number of bedrooms it contains. The various rooms are all separate, and separately approached from passages or corridors. Going back a hundred years we find much the same distribution of accommodation and ways of access as in the twentieth-century house. In the days of Queen Anne there was no essential difference either. We still find the entrance hall or passage, the separate reception-rooms, and the separate bedrooms, although these are not so rigidly separated as nowadays. But in a house of the time when James I. came to England there was a considerable difference. The entrance hall is relatively more important; indeed, it is doubtful whether it ought not to be regarded as a living-room rather than an entrance. Just about this time a very momentous change took place in the traditional house plan, viz., the hall began to be regarded as a means of access to other rooms, instead of a room in itself. Many of the bedrooms also lead one into another; but the kitchen department is still quite separate and distinct.

Thirty years or so further back still we find a different idea prevailing. The hall is now the principal apartment of the house; it lies in the middle; at one end of it are the rooms devoted to the family, at the other those required for cooking and for the work of the servants. There are still a certain number of bedrooms; but going further and further back the bedrooms become fewer and fewer, until we arrive at a period when the house consists only of a great hall, a kitchen with its necessary adjuncts, and perhaps a room or two for the private use of the family. We have now reached the irreducible minimum of house accommodation, i.e. a hall and a kitchen, or a place to live in and a place to cook in. Early dwellings in England and elsewhere would seem to have consisted of a large shed occupied by the cattle at one end and by the owners at the other. Such dwellings were heated from a fire in the middle of the floor, the smoke from which escaped through a hole in the roof. This arrangement held the field for many centuries, and was used in England as late as the time of Edward VI.

When English people required houses capable of withstanding attack and less likely to catch fire of themselves, they built them of stone, but retained the ancient ideas of arrangement. They were, however, sufficiently advanced to desire the cooking to be done in a kitchen. Few remains of these early houses have survived. But there was another class of dwelling, contemporary with the early manor houses, which from its superior strength has survived in greater numbers, namely, the castles. These were not necessarily military strongholds; many were strongly fortified houses; and in any case some portion of them was primarily a house.

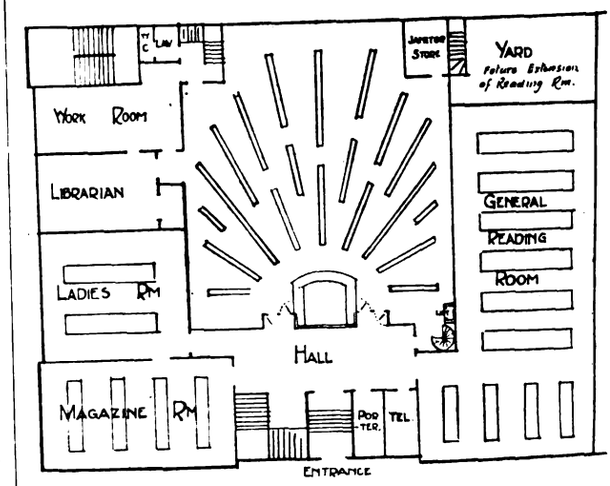
One of the earliest and also one of the smallest of these was the Peak Castle in Derbyshire, picturesquely situated on the summit of one of the steep sides of a dale. It was placed in what would be in those days an impregnable position; and in the most inaccessible part of the walled enclosure stood the house of the owner. The style of architecture is characteristic of the Norman period. The residential portion consisted of a

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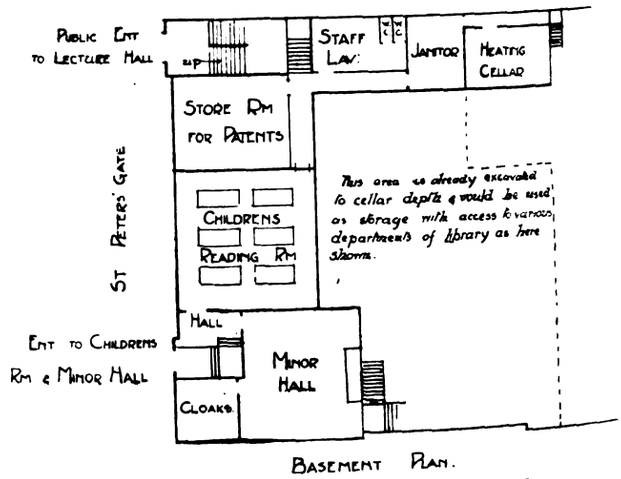


First Floor Plan

Lawrence Street.



Wellington Road South

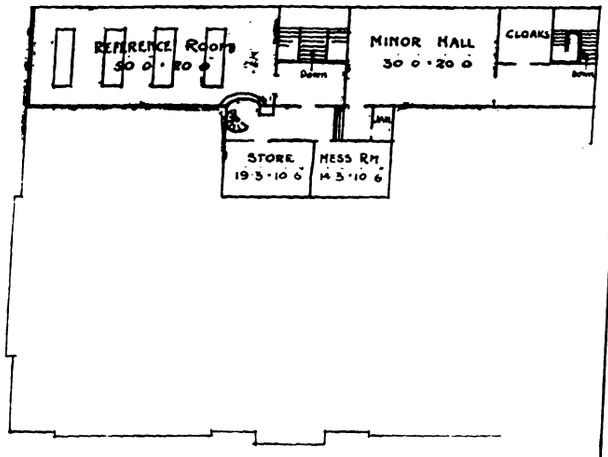


Basement Plan.

SECOND PREMIATED DESIGN.—By Mr. JOSEPH HOLT.

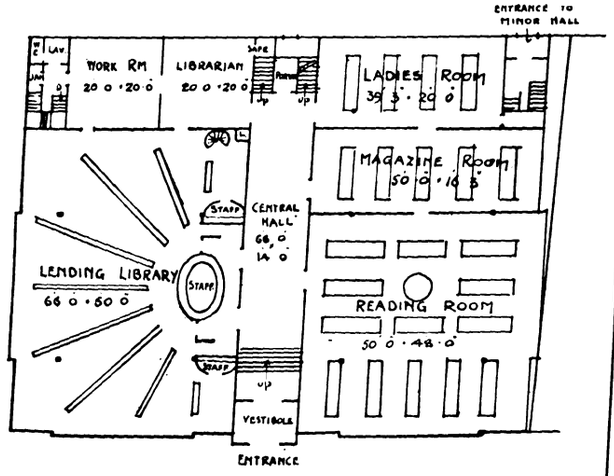
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COMPETITION FOR CARNEGIE LIBRARY, STOCKPORT.

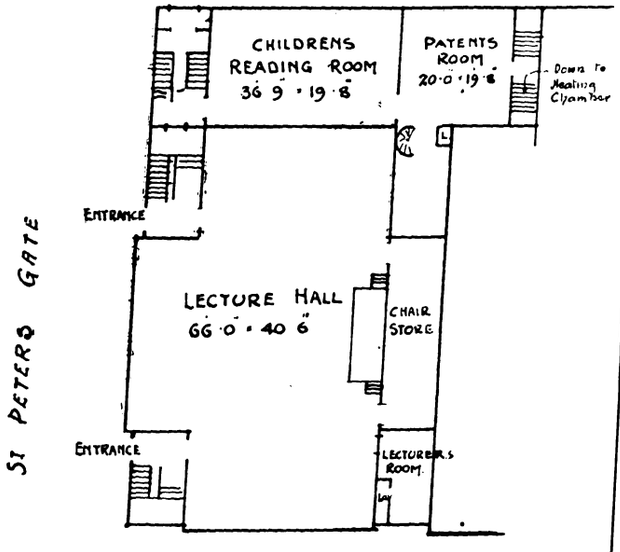


FIRST FLOOR PLAN

LAWRENCE STREET



WELLINGTON ROAD SOUTH.



BASEMENT PLAN

THIRD PREMIATED DESIGN.—By Mr. GEORGE H. WENYON.

basement, a ground floor some 4 or 5 feet above the ground, and an upper floor. Warkworth Castle, a "worm-eaten hold of ragged stone," dates from the end of the twelfth century, and in its plan shows the general idea of a castle enclosing wall with buildings against it. Castle Rising is of much the same date as the Peak Castle, perhaps a little earlier, but it is much larger and more complicated. In the latter each floor was occupied by one room, in the former there are several rooms. At Castle Rising the great hall is on the first floor, the ground floor being devoted to store places and a guard room near the entrance. There is also believed to have been a kitchen, though at the dais end. In addition to the hall there was a large room, approached from it, which served possibly as the lord's own room or solar. The chapel leads out of it. A chapel is frequently found in these early houses. As a rule they were small; at Coningsburgh one was contrived in the thickness of the wall augmented by one of the huge buttresses. Space was so valuable that they were frequently used as the lord's own room, where he transacted his private business. Another feature was the placing of all the garderobes on the west wall, so as to secure complete privacy. Castle Rising is more embellished than the Peak Castle, and there is a certain amount of ornament introduced for ornament's sake in the shape of circular recesses filled with grotesque heads. The approach to the entrance door is up a long flight of stone steps, defended in three places by doors. At the Peak there was probably nothing more than a wooden ladder.

There was in existence a more domestic class of structure, such as Oakham Castle. In an inquisition of 1340 this building is set down as consisting of castle well walled, one hall, four chambers, one kitchen, two stables, one grange for hay, one house for prisoners, one chamber for porter, one drawbridge, and a free chapel within castle. The building consists now of only the hall. The kitchen was probably of wood, as was often the case. Both within and without the hall bears some resemblance to a church. This frequent resemblance has led to many old halls being called chapels. Usually there was a screen across the entrance of the hall so as to protect the inmates from the draughts. At the further end was the dais or raised platform, and from this end the solar was approached. The fire was placed in the centre of the floor, and towards the lord's end. The town houses of the period have nearly all vanished, one still exists in the Jew's House at Lincoln. Longthorpe Tower, late thirteenth century, shows the Midland version of the Peel Towers of Northumberland.

Woodcroft Castle could only have been a fortified manor house, for although surrounded by a moat it was without the defence of a drawbridge. Over the centre archway was the chapel, at the front end of which was a gallery, approached by a flight of steps outside the wall of the tower, but under the adjoining roof. Rockingham Castle was the home of the early kings of England when they went down to the great Forest of Rockingham to hunt. It is on record that John was there many times; so, too, were Henry III., Edward I., and Edward III. Contemporary records show how the castle was kept in repair. The sheriff of the county in 1225 was ordered to take with him proper and discreet persons, who thoroughly understood carpentry and masonry, to examine the Royal chamber, where repairs were necessary, and to see that the same were immediately carried out. In 1226 the Royal chapel was repaired, and a load of lead was ordered for the gutters. Thirteen years later it was certified that the castle had been left in a very ruinous state. The many dilapidations were immediately remedied. In 1279 labourers were paid for removing earth with spades; among those so engaged were five women. A record of another kind, dated 1215, is to the effect that Peter de Barr and Nicolas de Hugevill, foot cross-bowmen, were sent by King John, with commands that they should be placed in the castle for its defence, and be paid sixpence per day. Rockingham was, however, not primarily a place of strength, but a fortified residence and place of detention for notable prisoners.

Of the internal features of these early houses there are not many left. The family rooms received a certain amount of decoration according to the wealth of the occupants. The hall had an open timber roof, on which the carpenters spent their trained skill. Very few of the windows were glazed, but were closed with wooden shutters, ornamented with heraldry. The walls were frequently plastered. At Abingdon is a very early specimen of the treatment of the fireplace. In the room below is another fireplace, which had its own separate flue, and which emitted the smoke through a grating let in in the thickness of the wall.

Haddon Hall, said Mr. Gotch in conclusion, tells a threefold tale. Its windowless front speaks of the cheerless times when the necessities of defence dictated all arrangements; its wide extent speaks of the more spacious and less strenuous days which were presently to come; its whole appearance speaks in the voice of romance. Rude and comfortless as these early houses may be pronounced to be they were the dwellings of a sturdy and determined race. But it was not so hardy as to despise all comfort, to prefer draughty and smoky rooms, or the turning of the hall into a crowded dormitory at night.

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THE GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.

AT a meeting of this Society held on Friday evening last in the Technical College, Glasgow, Mr. John Bowman (President) in the chair, Professor Charles Gourlay, B.Sc., A.R.I.B.A., delivered a lecture entitled "Elementary and Advanced Building," or the differentiation of elementary from advanced work in the teaching of building construction. After a few introductory remarks the lecturer defined elementary building construction as the study of the fundamental principles of the subject and the application of these principles in the erection of the most common type of building belonging to the district in which the subject is being taught. Emphasis was placed upon the students being led to observe the application of principles in the erection of an actual building instead of simply studying drawings without reference to a building. Advanced building was defined as the study of building materials and the further application of principles to be observed in the erection of less common types of buildings. The lecturer then exhibited a most interesting and instructive series of slides, consisting of two sets of building-construction drawings, in order to clearly explain his definitions. In the first set he showed the work generally met with in cottages and tenements which he called elementary, and in the second he showed complete drawings for the construction and finishing of a large house, displaying the greater elaboration required in such, which he described as advanced.

THE MANUFACTURE OF PORTLAND CEMENT.

AT a meeting of the Concrete Institute held on the 27th ult. at the Royal United Service Institution, Whitehall, S.W., Mr. A. C. Davis, F.C.S., A.Inst.C.E., M.C.I., read a paper under the above title.

Originally invented in England some three-quarters of a century ago, the British makers of Portland cement, according to Mr. Davis, adhered solidly to old-fashioned methods for some decades, but which have now at last had their day. It has been only within the past ten years that the British cement-maker has awakened to the seriousness of foreign and home competition. For some years we have been actively engaged in building modern cement works and putting down up-to-date plant in our obsolete factories, with the result that for quality of product, combined with low cost of production, the British manufacturer has nothing to fear from over-sea competitors, and British Portland cement to-day has no rival in quality the world over.

It is safe to assume that one of the Thames tunnels, constructed in 1828, was the first engineering work of importance in which Portland cement was used. The price at that time was, by the way, 21*s.* per cask at the works. To-day a much superior quality product can be purchased at some 4*s.* per cask, so much have the conditions of the industry altered in the past three-quarters of a century.

Now, what is Portland cement? The term "Portland" is limited to a hydraulic cement containing a large percentage of lime, and at once distinguishes the valuable constructive material bearing that title from other cementitious substances. The British standard specification defines Portland cement in the following terms:—"The cement shall be prepared by intimately mixing together calcareous and argillaceous materials, burning them at a clinkering temperature, and grinding the resulting clinkers."

The centres of the manufacture of Portland cement are well distributed over the country. The normal size of a factory is one having an output of some 500 to 1,000 tons of Portland cement per week, and in this country alone we have some eighty cement companies, with a total output of some 3,000,000 tons of cement per annum.

Portland cement can be produced from any raw materials containing constituents capable of yielding by calcination the silicates and aluminates of lime which form its chief components, and the necessary constituents of those raw materials are lime, silica, and alumina. Small additions of iron oxide are desirable for fluxing these materials.

In manufacturing Portland cement carbonate of lime and clay are first efficiently and accurately amalgamated in certain fixed proportions, either by the addition of water to the raw materials or by the fine grinding and mixing of the same in their dry state. The composition of a prepared mixture of these raw materials should be, roughly, three parts of chalk to one of clay.

In the Thames and Medway districts the chalk formation on the banks of these rivers is quarried, and this material is mixed with the deposits of mud found in the estuaries and creeks.

The chalk marls around Cambridge have been well proved to be eminently suitable for the manufacture of a first-class quality cement. The "marl" is a deposit of calcareous and argillaceous material found at the base of the local chalk. The chalk marl of Cambridgeshire, though the relative quantities of chalk may vary from yard to yard in depth when testing on the face of the quarry, contains in the aggregate about the same proportion of calcareous and clayey material as is obtained artificially by the mixture of chalk with alluvial mud in the Medway Valley. Therefore, along the outcrop of this chalk marl cement works have of recent years proved the value of the Cambridge deposit from a cement-making point of view.

In the cement-making districts of Rugby and South Wales we have the well-known Lias formation of limestone and shale, and this is successfully treated for the manufacture of Portland cement. The thin layers of these materials, with their variation in composition, must, similarly, be very accurately and efficiently dealt with. In working the Lias formation it is found that the preponderance of shale in proportion to limestone (which is generally found to contain 78 to 85 per cent. of carbonate of lime) renders the cost of working heavy, because of the removal of surplus clayey material not required in the manufacture.

On the Tyne, Wear, and Tees, and in the North of England generally, Portland cement is manufactured from chalk imported from the Thames, Medway, or Sussex districts, and this is mixed with a local clay found on the site of the works. From this mixture a good quality cement is manufactured.

In the United States most of the cement produced is from the Lehigh Valley argillaceous limestone, which contains rather more clay than is required for a correct mixture. To this a small amount of pure limestone, usually 10 to 20 per cent., is added to bring the mixture up to the necessary percentage of calcium carbonate required in the manufacture.

In Germany the raw material consists of chalk marl.

The primary conditions of any method of Portland cement manufacture are that the raw materials shall be (1) correctly proportioned, (2) very finely comminuted, and (3) thoroughly mixed.

The proportions of chalk and clay must be kept to a standard as closely as ever possible, work which at the present time in the most successful cement works is carried out under the supervision of the works chemists. The reduction of the raw materials depends chiefly upon their character, so that the details of the methods adopted by manufacturers for grinding generally vary with the raw materials used.

There are two principal methods of reducing and mixing the raw materials, namely: Firstly, by the "wet process," applicable only to soft materials, the correct quantities of the raw ingredients being ground and mixed by the aid of a considerable amount of water. Secondly, the "dry process," in which the perfectly dry materials are ground together to an impalpable powder or "flour," and subsequently mixed to correct chemical proportions.

The next stage in the manufacture of Portland cement following the scientific and mechanical preparation of the raw material is that of burning at a high temperature, or calcining, the raw product at a point of slight vitrifaction, resulting in what is commonly called a cement "clinker."

The proper degree of burning is indicated by the formation of a dense greenish black clinker when coming from the kilns. Light-burned clinker is brownish and soft, while over-burned clinker is fused and slag-like.

The aggregate temperature in the process of calcination shows that for normal Portland cement burning a heat is required in the kiln amounting to 1,400° C., or 2,500° F. This temperature is variable, according to the percentage of carbonate of lime contained in the raw materials; namely, the higher the proportion of lime the higher the temperature which is necessary to produce complete diffusion in combination with silica.

The kilns for burning the raw materials are always constructed for either an "intermittent" or "continuous" process. The intermittent kilns require loading and drawing and demand the shutting down of the kiln during the drawing operation. This method of manufacture is one that will soon be discarded. But in the continuous kilns the burning of the raw material proceeds without a break, and the drawing of the clinker takes place at the same time without interruption, thus making a continuous process.

In the category of continuous kilns we come to the process of burning by the rotary kiln, which has been lately brought

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into use. The manufacture of cement by the rotary kiln may be said to have revolutionised the industry, and this method of burning the raw materials is perhaps the most scientific and practical invention that has been introduced into the manufacture since Portland cement was first known.

The rotary kiln consists of a slightly inclined steel or wrought-iron cylinder, usually from 100 to 150 feet in length and 6 to 8 feet in diameter, and is inclined to the horizontal at about 1 in 30. The kiln is lined with radial firebricks, some 9 in. in thickness, and the long cylinder is mounted on tyres running on rollers and slowly rotated by gearing.

The cement-making materials are continuously fed into the kiln through a pipe at the upper end in the form of either liquid mud or dry powder, according to the process adopted in preparing and mixing the raw materials. Finely ground coal is almost always used as fuel, and this is introduced into the lower or outlet end of the kiln by a jet of air issuing from a blast fan.

The raw material as it gradually descends into the zone of heat generated by the perfect combustion of the finely ground coal fed into the cylinder from the opposite end parts with any carbonic acid, forms little rounded balls, which reach a nearly white heat in the lower third of the kiln, and finally issues at the lower end as well-burned clinker in grains about the size of a large pea. The greatest heat is naturally near the fuel-jet or outlet end of the kiln. The hot clinker from the kiln is cooled either by being elevated to cooling towers or by rotary cooling drums.

Now, proceeding with the manufacture of Portland cement, when we arrive at the succeeding and final stage in the process we have the grinding into an extremely fine powder of the clinker which comes from the kilns; and this process has exercised quite a large proportion of ingenuity during the past few years.

The true test of quality in a cement to-day is the fineness to which the cement is ground. In modern works the preliminary grinding of cement clinker is carried out by the ball mill, and from this mill the coarsely ground material is conducted to a tube mill, which finishes the fine grinding previous to storing the cement.

The finished cement is ground sufficiently fine to pass through a 76 by 76 mesh sieve with about 1 per cent. residue, and although finer grinding is rarely demanded, it can be readily accomplished by the manufacturer if necessary; but this means a reduced output from the plant.

From the grinding mills the cement is conveyed into the stores, and after it has cooled down the material is ready for loading out at the factory.

As to the storage of Portland cement, it is generally considered that the longer the cement is kept in stock the more reliable it is found to be in use; but the modern product of to-day's manufacture requires neither storage nor aeration to provide and ensure the success of its quality.

Mr. H. K. G. Bamber, F.C.S., in opening a brief discussion, said he would like to thank Mr. Davis for his attempt to further educate the user in the important subject of Portland cement. The paper had been a complete compilation of facts well known to manufacturers, and did not lend itself to discussion. He quite agreed that the present-day cement, manufactured on scientific lines, particularly if it was in accordance with the British Standard Specification, did not require aeration before being introduced into the work such as it used to receive. Mr. Davis had said it was desirable that the material should be cooled down before loading into bags, and therefore the manufacturer generally to keep sufficient stock to provide a perfectly cool cement. It was becoming the custom in most important works to introduce mechanical cooling apparatus. The cooling was a most important factor in the quality of the output.

Mr. Blyth described the paper as a most simple and elementary discourse on the manufacture of cement which everyone should be able to fully understand; in fact, he would call it a child's guide to knowledge. Mr. Davis had rightly recommended that engineers, instead of being so strict on theoretical specifications, should take more opportunities to inspect the factories and see how the cement was made. They should, however, visit not only the places where the manufacturer wants to take them, but also those past which he might want to get them.

Mr. A. O. Trechman, speaking as a manufacturer, said he could not fall in with the suggestion that the cement works should be inspected before being invited to tender. It would, in his opinion, be a very difficult matter for the average manufacturer to instruct the host of architects and engineers who use cement. A whole day was necessary to describe thoroughly the process of manufacture. On the other hand, we have now arrived at a standard specification which has been quite recently improved, and that is a sufficient safeguard for the ordinary user. In conclusion, Mr. Trechman said he would, if it were permissible, ask whether any members had noticed the effect of humidity of the atmosphere on the setting time. He himself had lately gone in for recording facts, but had not yet any results to report.

Mr. Alfred Brooke thought the only possible objection to the paper was that it might give the impression that there were no difficulties in connection with the manufacture of Portland cement. It was to be hoped that a paper would be read before the Institute which would clear up some of the difficulties with which they have to deal.

Mr. A. C. Davis briefly replied, and the meeting terminated.

EXCAVATION OF BROCH OF COGLE, WATTEN, CAITHNESS.*

It is due to Dr. Anstruther Davidson, Los Angeles, that the existence of the broch was proved. Dr. Davidson had seen the mounds of California, and on a visit to his birthplace in August 1905 he resolved to test the possibility of this Cogle mound containing anything of a bygone age. It stood about 6 feet high and 60 yards in diameter. He made a trial cut through the middle, and from this was satisfied there was here another of those prehistoric buildings called brochs or Picts' houses, of which Mousa, in Bressay, Shetland, may be regarded as the best preserved specimen.

Dr. Davidson now resolved to excavate and investigate, and communicated with Mr. John Nicolson, Nybster, who had helped Sir Francis Tress Barry, M.P. for Windsor, in his explorations of similar structures at Keiss.

The plan was carefully drawn by exact measurements on the spot by Mr. Nicolson. The only entrance, about 2 feet wide, to the Cogle broch is on the west. At the Scottack and other excavated Caithness brochs the entrance is on the east.

The thickness of the walls is 15 feet, and the circle enclosed has a diameter of 30 feet. There were two upright flagstones 2 feet high and 2 feet apart. The average height of the walls remaining *in situ* would be about 3 feet. Probably 60 or 70 feet had fallen and helped to form the mound. Vegetation had grown and decayed and buried the stupendous structure for ages. Who were the broch builders and when did they live? are interesting questions. Dr. Davidson identified five successive layers of ashes and pavement, and the charred remains of wood indicated the fuel. Trunks and branches of pine, birch, and hazel-nuts are frequently got in peat cutting at considerable depth in Cogle moss.

Dr. Davidson made sections of some of these pines, and found that their annual rate of growth coincided with that of the charred fragments found so abundantly in the broch.

The most important of the neolithic remains were the stone pestles found in the lowest stratum of ashes. These, over twenty, were in only a few instances pestle shaped. They were made of hard-grained, basaltic-like stone, and were originally of oval or oblong shape. By constant use in pounding the edges were bevelled, and a few of them were worn quite circular and bevelled all round. Two stones with shallow mortars were found. Some saddle querns with the usual manu or hand-grinding stone. Numerous stone pebbles, probably used for sling stones, were found.

Almost all the bones were broken to extract the marrow. None showed evidence of fire, and the condition of the bones would show that they were very imperfectly cooked. Parts of tusks of boar, goat, horse, and ox could be identified, and also bat, with probably great auk. These have been sent to Professor Bryce, Glasgow University, for further investigation.

The Manchester Town Council last week adopted the following proposal of the Royal Infirmary Site Committee:—"That the Lord Mayor be requested to invite the President of the Royal Institute of British Architects to nominate an assessor to advise this committee (in consultation with the city architect) in connection with competitive designs for a library and an art gallery to be erected on the old infirmary site."

* Abstract of a paper presented to the British Association at Sheffield, 1910, by Mr. Alex. Sutherland.

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PEMBROKE COLLEGE, OXFORD.

By the Rev. DOUGLAS MACLEANE, M.A.

(Concluded.)

THE chamber on the second floor of the tower was JOHNSON'S. Passing into the little "Old Quad," we turn to the right and enter the library. Here we are in the only bit left of Broadgates Hall, at which so many famous men were educated. When, at the instance, though not at the cost, of JAMES VI. and I., Pembroke College was founded in 1624, it carried on, with unbroken continuity, the life, traditions and personnel of the Aula Lateportensis. But the buildings of the Hall were unimposing and crumbling with age. Accordingly the only one preserved was the refectory, which had just been enlarged. It is now the College library. Close by BONNER drudged as a scullion—when raised to the bishopric of London he presented a great brass cauldron to the Broadgates kitchen, "in token whence he had his rise." Here budding Elizabethan poets sonneteered, and here a turbulent commoner from Lichfield circulated verses abusing the College ale, which GEORGE WHITEFIELD a year or two later poured out for "the gentlemen," as he had done in his mother's alehouse at Gloucester. It was in this room that JOHNSON astonished his fellows by improvising a declamation which he had been too lazy to write out; and here, on the other hand, WHITEFIELD, confessing that he had been hindered by SATAN from writing his theme, "publicly suffered for his Master's sake." He was not unkindly treated, however, by the authorities of this his "sweet retirement." It was his duty, as a servitor, to go round the staircases at ten every night, knocking at each door, and he tells us that he trembled at every stair lest the Evil One should appear to him. It was also an undergraduate pleasantry to hunt the servitor on duty round the College with banging of pot and kettle and singing of "Chevy Chase." Unfortunately WHITEFIELD'S own chamber, where occurred so many spiritual combats, prolonged mortifications of the flesh, and sweet and happy hours of religious intercourse cannot be identified. He loved his old College to the end of his life. One would like also to know which were BLACKSTONE'S rooms, and out of which window SHENSTONE hung with his dilettante friends, GRAVES and WHISTLER. Before leaving the old refectory, it may be mentioned that 2,000*l.* was spent upon it in preparation for the College bicentenary in 1824—the "Gothic" windows are of that date—and that among the juniors who took part in the great Gaudy on that occasion were the two future poets, ROBERT STEPHEN HAWKER, the mystic, and THOMAS LOVELL BEDDOES, the revolutionist.

Many strangers peep, it may be, into the "Old Quad" of Pembroke without adventuring further. A few steps more would bring them into the pleasant New Court, with its chapel, hall and domestic buildings standing verdure-clad round a grassy space. JOHNSON showed HANNAH MORE where they used to play cricket. But the formal gardens of his day and the ancient "Back Lodgings" which stood there disappeared sixty years ago. Dr. JEUNE, having about that time built a range of fellows' and undergraduates' rooms, next collected funds for a new dining hall, which is not a bad example of the revived Perpendicular of the later forties. The timbered roof is especially handsome. The architect of these buildings was CHARLES HAYWARD, BARRY'S nephew and pupil, and the total cost about 12,000*l.* A little bit of the former walled garden was preserved, but the old two-storeyed summer common-room, where JOHNSON used to play at draughts with JONES and FLUDYER ("who turned out a scoundrel, a Whig"), was swept away. JEUNE was not ecclesiastically minded. But after his time the idea was sometimes mooted of a Gothic chapel to take the place of the "neat Ionic structure" to which the Pembrokians had migrated from the St. Aldate's south aisle in 1732. In 1749 SALMON wrote:—"The Chapel is a fine Piece of Architecture (but not large), built of hewn Stone and extreamly well furnish'd without and within. The marble Pillars, particularly, at the Altar are exceedingly beautiful." The exterior is shown in *Oxonia Depicta* of 1733. Fortunately it was spared by the mid-Victorians. In 1884, however, some 3,000*l.* having been subscribed, the somewhat plain interior was enriched and beautified by the sympathetic skill of the late Mr. C. E. KEMPE, himself a Pembroke man. The glass, after the Renaissance style, in the eight large windows and one demi-window, is, I think, the finest he ever produced, and is truly superb. The decoration of the walls and ceiling has suffered seriously from fumes of hot-water pipes, but it is about to be renewed at the expense of Mr. WALTER TOWER, carrying out Mr. KEMPE'S intentions. The tall silver-gilt cross and candlesticks on the altar should be noticed. The latter are a reproduction of two of ANNIBALE FONTANA'S exquisite bronze lights at Pavia. Mr. KEMPE also designed a new chalice and paten for the chapel. It may be mentioned that the collection of plate belonging to this College is unusually fine. Of its pictures by far the most valuable is the famous JOHNSON painted by REYNOLDS for the SPOTTISWOODE family. Personal relics of JOHNSON are the deal desk on which the Dictionary was written, another desk, the original MS. of the "Prayers and Meditations," his teapot, gruel-mug, &c. When in his later years he used to revisit the College the chapel used to be crowded with persons curious to see "the great Cham of literature," who there with tears commended to GOD his departed friends.

Pembroke College, by a gradual growth, has now come to cover the whole space between St. Aldate's Street on the east and St. Ebbe's Street on the west. Its southern boundary is the old city wall, below which runs Brewers' Street. If ever it were to require enlargement this could only take place to the north in Pembroke (anciently Penyfarthing) Street, where the College owns property. But it is a good thing for Oxford to possess a few small colleges.

ILLUSTRATIONS.

ST. CUTHBERT'S, KENSINGTON, LONDON, S.W.

THE canopy over the pulpit was erected in 1907. It is of carved oak and follows the plan of the pulpit, which is an unusually large one, with steps up each side. The canopy is richly carved and traceried with the emblem of the Holy Spirit in the centre. The large crucifix is also of oak, and was added at the same time. The work was executed by J. LENEGAN, and designed by Mr. J. HAROLD GIBBONS, A.R.I.B.A. The scheme for mortuary chapel and cloisters at the same church was drawn several years ago, when the house and garden adjoining was purchased and presented to the church by the Rev. R. J. WALKER for the purpose. It consists of a secluded quadrangle entered by a lych gate, with Calvary in the middle. On one side of the quadrangle is the church and the new chapel opposite, connected by cloisters, with upper storey for books and reading recesses; but the building has been delayed owing to difficulties with the ground landlord, which now compel the cloisters to be abandoned.

The chapel will, however, be built with the altar to the south, the end opening into a bay of the south aisle. There will be a forecourt and open loggia on the east. Mr. J. HAROLD GIBBONS is the architect for this also.

OXFORD COLLEGE SERIES. PEMBROKE.—INTERIOR OF CHAPEL—INTERIOR OF HALL.

WE continue the series of views of Pembroke College with those of the Interior of Chapel and Interior of Hall, and shall continue with further illustrations of this College next week.

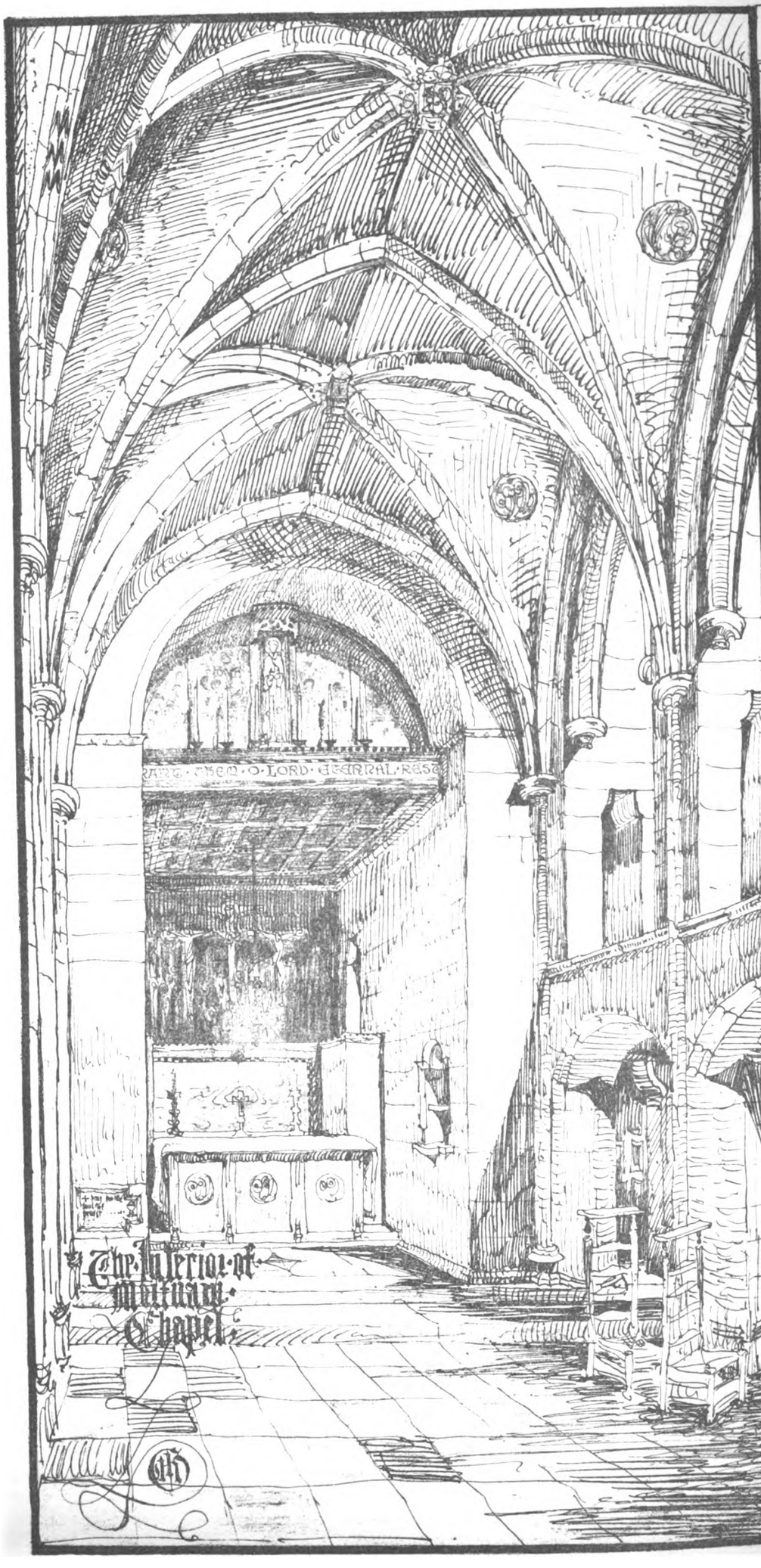
MESSRS. LITTLEWOOD, architects, Manchester, have been successful in a limited competition arranged by the Blackpool Winter Gardens Company for the reconstruction of the Opera House at Blackpool.

A NEW pavilion is to be added to King's Cross Hospital, Dundee, by the Town Council, at a cost of 2,100*l.* The accommodation is required for scarlet fever and diphtheria cases.

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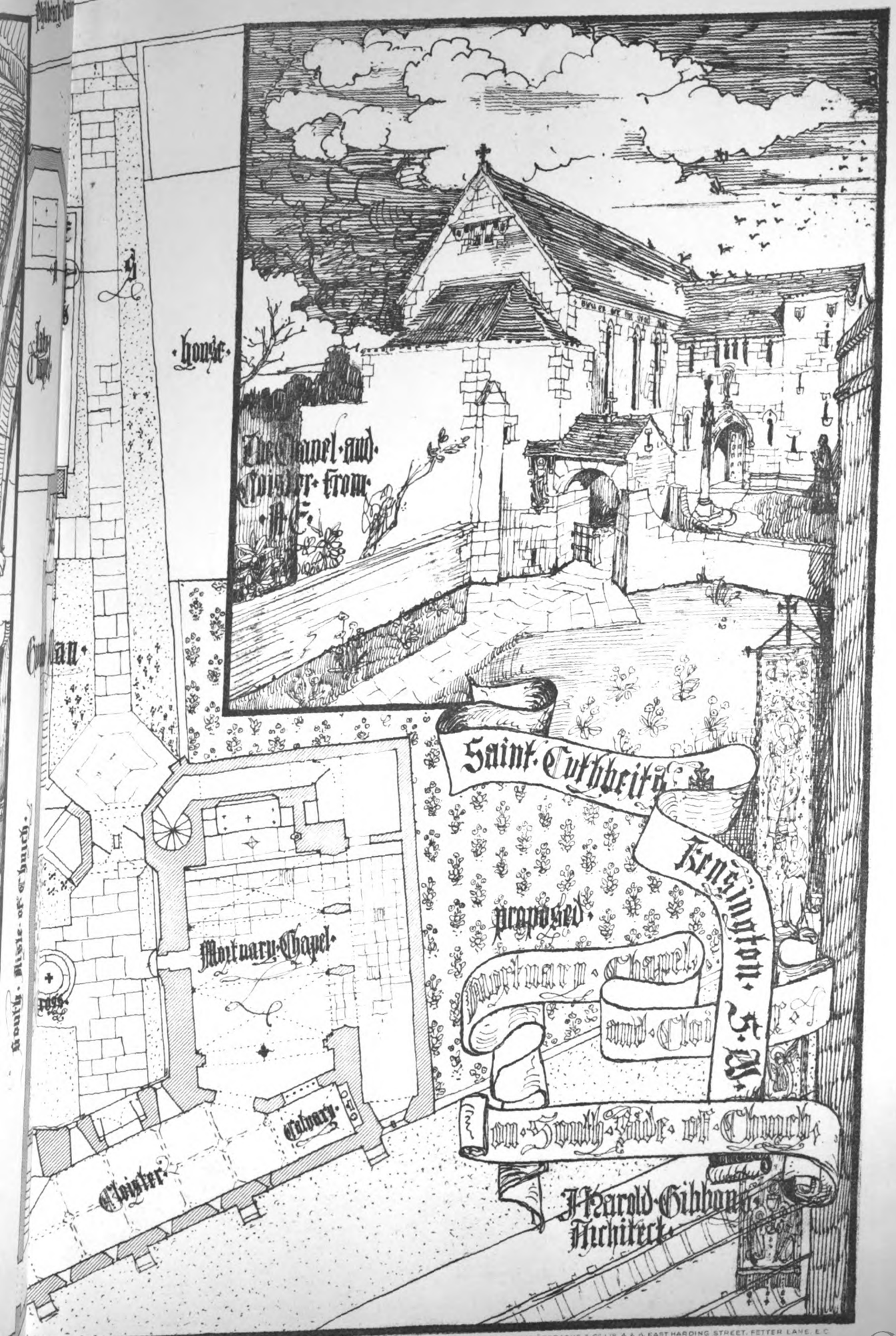
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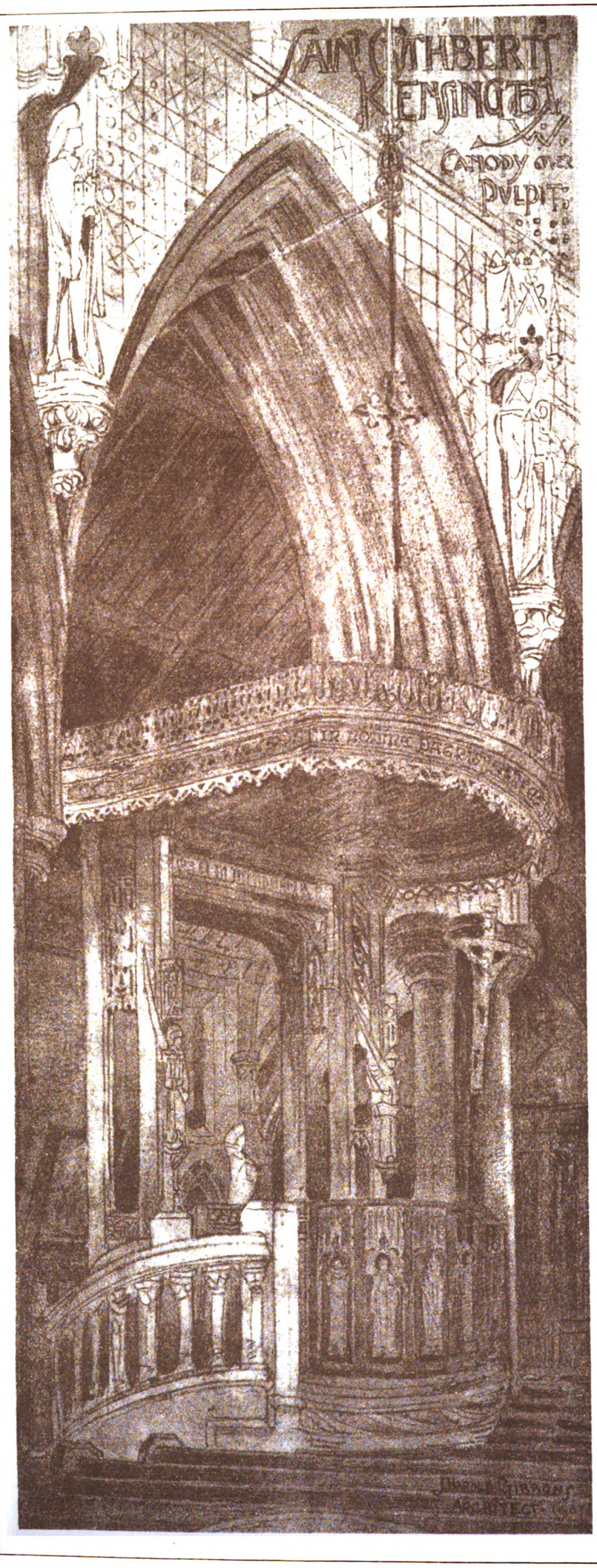


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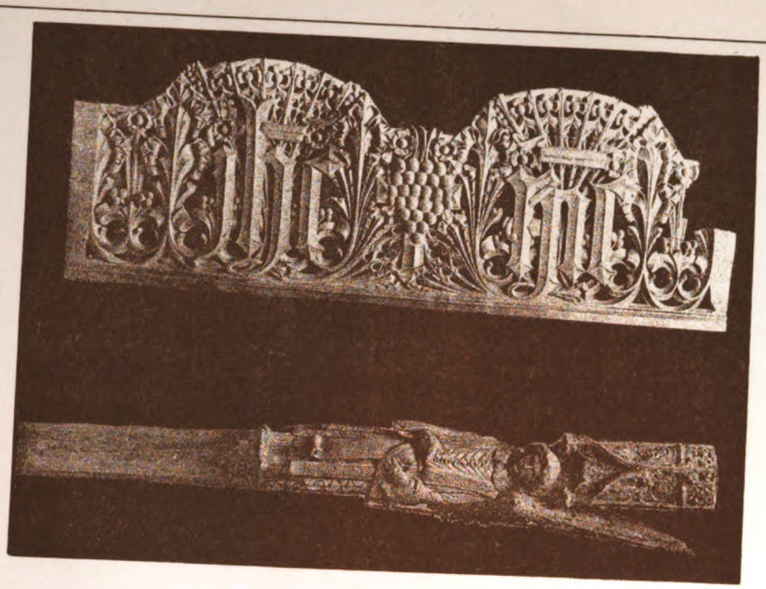


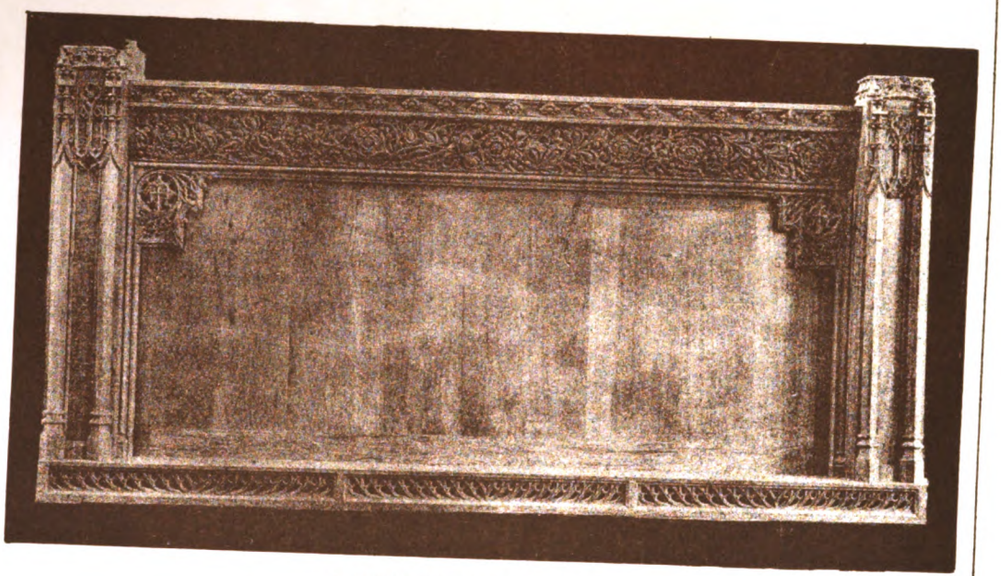


ST. CUTHBERT'S CHURCH, KENSINGTON: DESIGN FOR CANOPY
MR. J. HAROLD GIBBONS, A.R.I.B.A., AR

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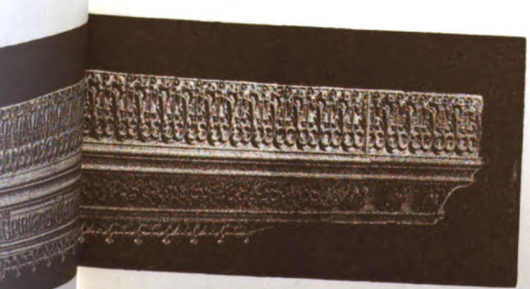




REREDOS IN LADY CHAPEL.







CANOPY OVER PULPIT, WITH DETAILS OF SAME.

R.I.B.A., Architect.

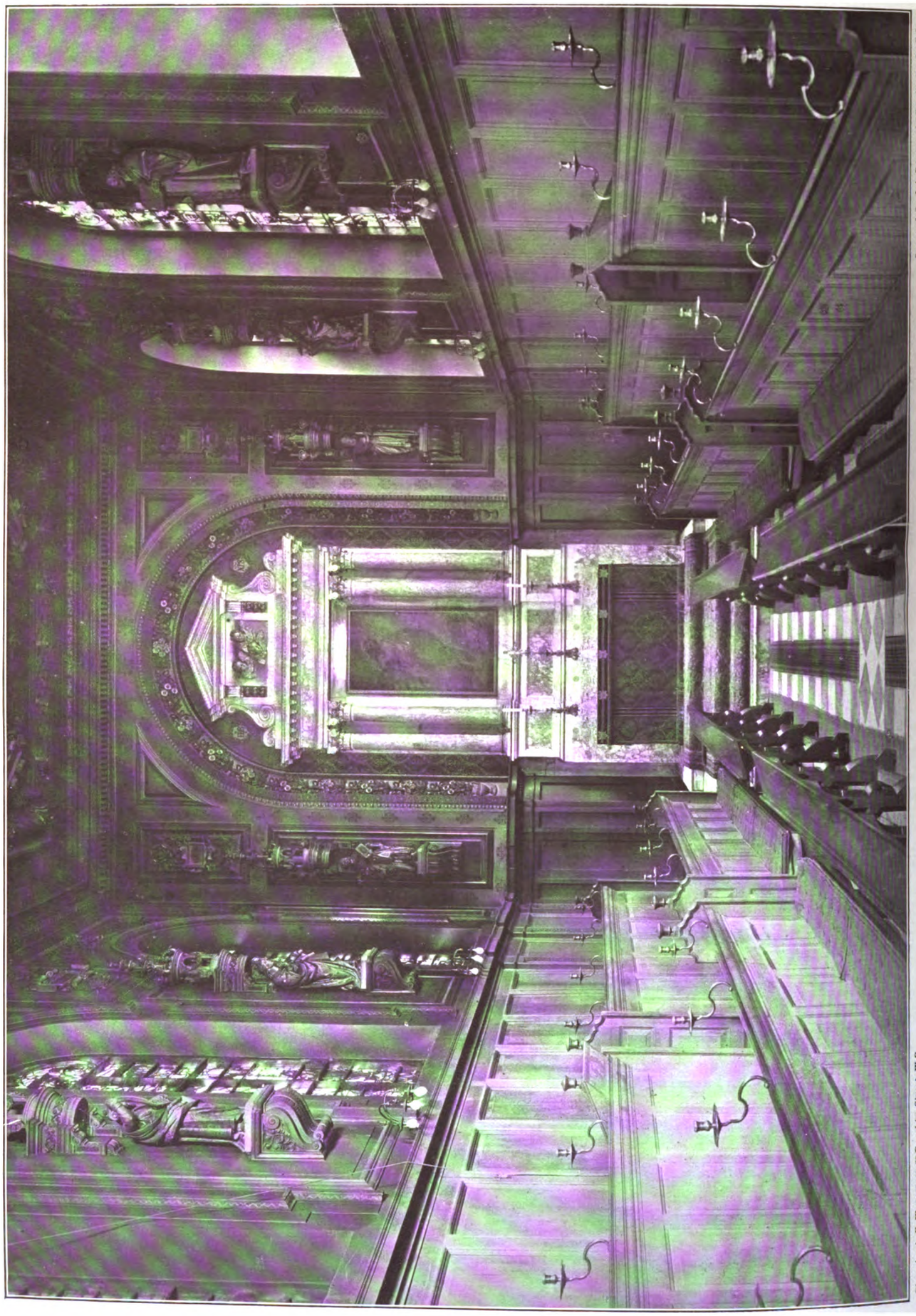
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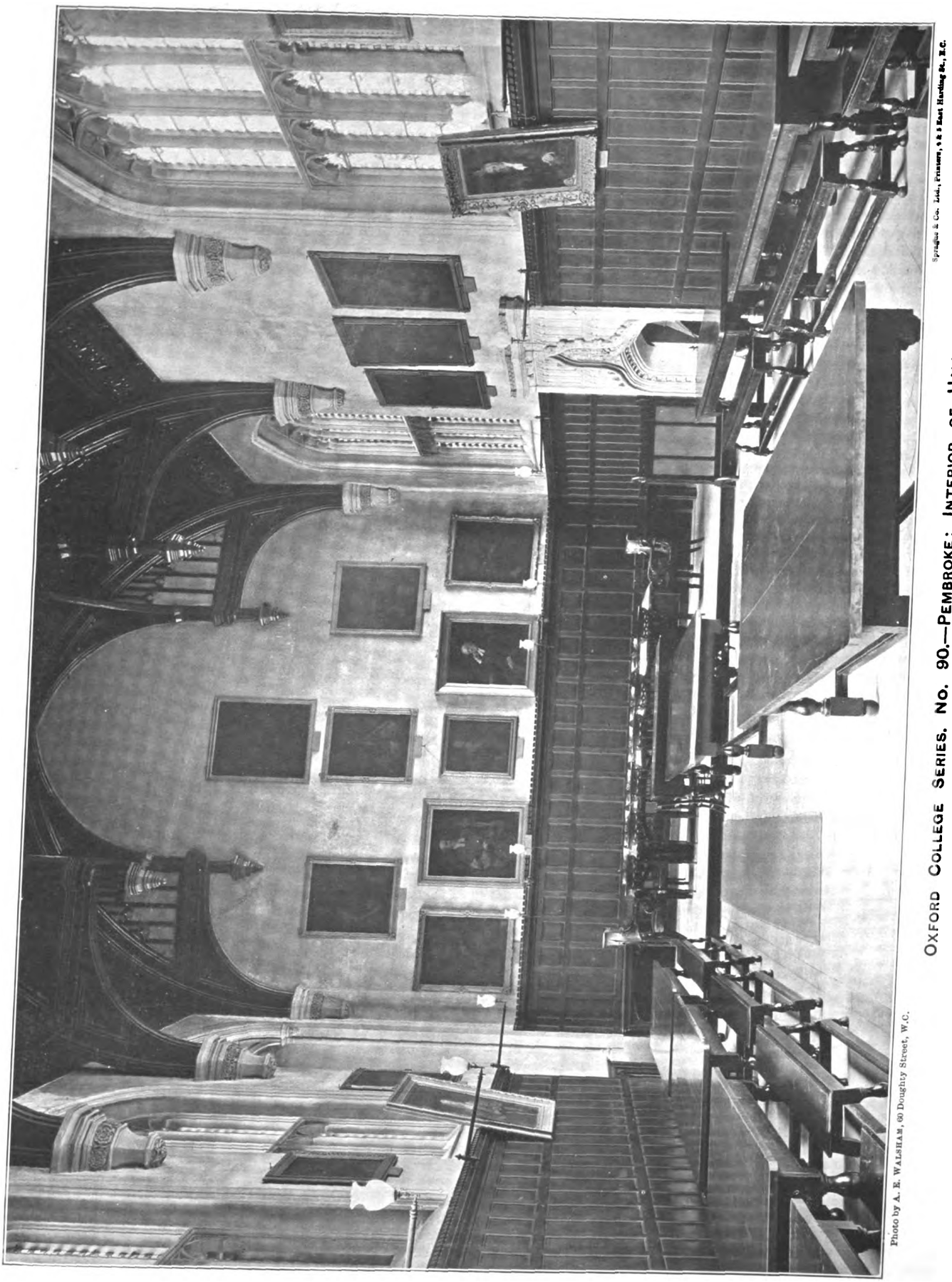


OXFORD COLLEGE SERIES. No. 89.—PEMBROKE: INTERIOR OF CHAPEL.

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OXFORD COLLEGE SERIES. No. 90.—PEMBROKE: INTERIOR OF HALL

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PETROL AIR-GAS.

THEORY AND PRACTICE OF THE NEW ILLUMINANT.

By Professor C. A. M. Smith, M.Sc.

(*Continued from page* 258.)

The Heating Value of Air-gas.

THE comparison of air-gas and coal-gas for heating purposes is simple, since we are not dependent on any indefinite standard, such as a "candle-power."

Taking the case of petrol, this consists almost entirely of hexane (C_6H_{14}). The number of heat units evolved by burning one gallon of this spirit may be calculated as follows:—*

Atomic weight of carbon = 11.97.

Atomic weight of hydrogen = 1.

$\therefore 6 \times 11.97 = 71.82$ lbs. of carbon combine with 14 lbs. of hydrogen to form 85.82 lbs. of hexane.

Now one gallon of hexane weighs $.664 \times 10 = 6.64$ lbs. This contains 5.55 lbs. of carbon and 1.09 lbs. of hydrogen.

When this burns to CO_2 and H_2O

Heat generated = $5.55 \times 14{,}450 = 80{,}700$

and $1.09 \times 61{,}260 = 66{,}800$

147,500 B.Th.U.

This is equivalent to 22,200 B.Th.U.'s per lb. It should be noted that this value is for pure hexane,

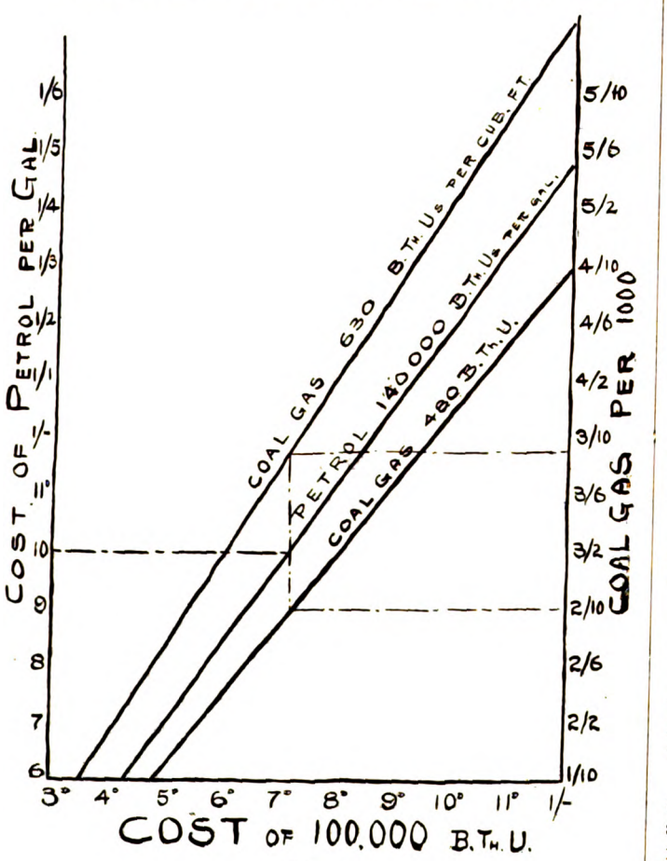


FIG. 4.

density 0.664, with no allowance for steam, which is assumed entirely condensed.

* It should clearly be understood that the theoretical calculations which follow, being based on the assumption that pure hexane is employed, would require modification in the case of actual commercial varieties of spirit. Hence results in practice may give slightly different figures, but they cannot differ to any great extent, and it is probable that the figures obtained are favourable to air-gas. It should also be understood that these scientific statements must not be compared with the "commercial" statements of gas companies and electric-light concerns; they are quite as capable of exaggeration as air-gas company representatives.

The following values are experimental:—

Sample.	Authority.	Density.	B.Th.U. per Pound.
Average . .	Wimperis	Average	20,300 to 19,300
Pratt's motor spirit (steam not condensed) . .	Hopkinson	.715	17,500
"Gazoline" . .	Witz	.708	20,410 (reduced from metric system)

Generally speaking, with the petrol used for making air-gas a good average figure for the calorific value may be taken as 20,000 B.Th.U. per lb., which, at a density of 0.700, is equal to 140,000 B.Th.U. per gallon. A high quality coal-gas has a calorific value of about 630 B.Th.U. per cubic foot = 630,000 B.Th.U. per 1,000 cubic feet. It is evident that whether the petrol be mixed with air before it reaches the burner or after, or whether more or less air be used, more heat units per gallon cannot be obtained than those stated above, and similarly for coal-gas.

Whence

$$\text{Cost per B.Th.U. with petrol} = \frac{1}{140{,}000} \times (\text{cost of petrol per gallon}).$$

$$\text{Cost per B.Th.U. with coal-gas} = \frac{1}{630{,}000} \times (\text{cost of gas per 1,000 cubic feet}).$$

Taking gas with a calorific value of 480 B.Th.U. per cubic foot (a low value, but one frequently found), the corresponding cost per B.Th.U. with coal-gas

$$= \frac{1}{480{,}000} \times (\text{cost of gas per 1,000 cubic feet}).$$

A number of values have been calculated from the above relations, and fig. 4 shows the relation of cost of gas per 1,000 cubic feet and petrol per gallon with cost of 100,000 B.Th.U.

Following the lines traced, and reckoning petrol at 10*d.* per gallon, it will be seen that this corresponds to coal-gas at 2*s.* 10*d.* or 3*s.* 9*d.*, according as the high or low calorific power-gas is taken. One air-gas firm uses petrol costing only 6½*d.* per gallon, and the equivalent cost of gas must be reduced accordingly. It will be seen that, heat unit for heat unit, petrol is probably more expensive than average coal-gas.

The curious point is that measurements on an illumination basis indicate that air-gas gives more light per B.Th.U. in the gas than does coal-gas.

The problem to be attacked in this work is

The Ratio of Candle-power to Calorific Value.

If sufficient air were introduced at the burner or otherwise in coal-gas to make its calorific value the same as a sample of air-gas, would it have the same illuminating value?

At this point it is well to point out that when one buys a gallon of petrol one is fairly certain of the number of available B.Th.U.'s one is getting, but with coal-gas tremendous variations are met.

All air-gas systems using the same grade of petrol cost the same per 1,000 B.Th.U.'s, although, as mentioned previously, when the gas is used for lighting, or even for heating purposes, it is essential that the mixture shall remain constant, otherwise trouble arises with the burners. If the mixture becomes richer after having been adjusted at the burner, the mantles blacken, if weaker, the light falls off seriously.

The Effect of Pressure.—Some official tests were carried out a few years ago with the Van Vriesland system, and the curve, fig. 5, and Tables II. and III., have been compiled from the original German figures, the metric units being reduced to English in Table III.

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TABLE II.

Kind of Burner Employed.	Pressure in Millimetres.	Candle-power. Hefner Standard.	Candle-power. Walrath Standard.	Candle-power. Normal Standard.	Consumption in Litres per Hour.	Consumption per Candle-power Hour. Hefner Standard.	Consumption per Candle-power Hour. Walrath Standard.	Consumption per Candle-power Hour. Normal Standard.
Amsterdam "Hassig" burner, using a mantle (known as the) "Durable" (Patent Kohl)	45	54	47	44.6	103	1.91	2.19	2.31
	90	60	52	49.5	122	2.00	2.30	2.46
	135	85	74	70	124	1.46	1.67	1.77
	180	109	93·6	90	135	1.24	1.30	1.50
	235	196	170	162	158	0.80	0.93	0.97

The above is a (translated) copy of the official figures. Since 1 litre of petrol was used to make 1,500 litres* of gas, and taking 1 Hefner c.-p. as equivalent to .9 English standard candles, the following exhibits the above reduced to English measurements:—

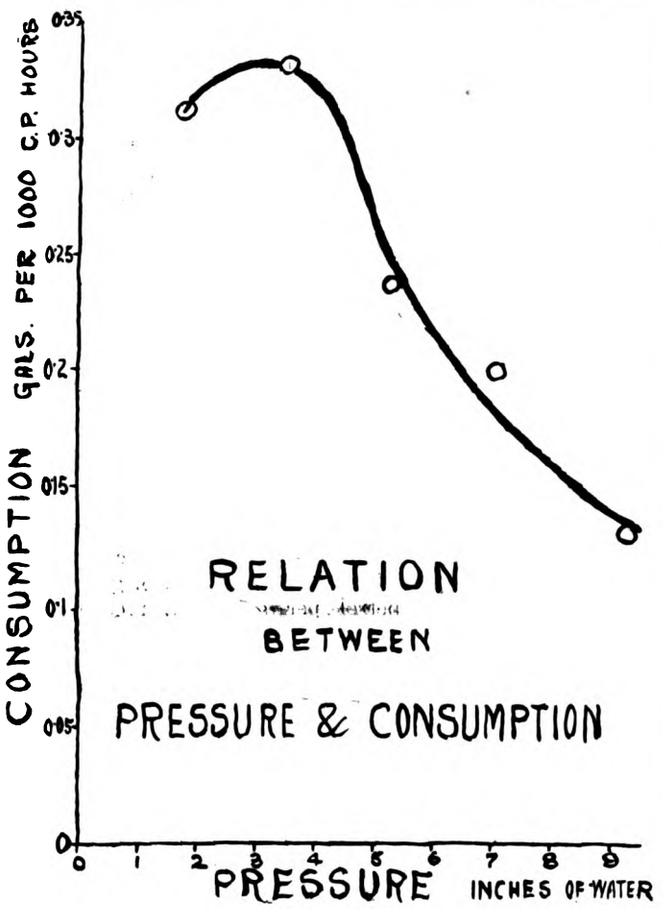


FIG. 5.

TABLE III.

Pressure in Inches of Water.	Standard Candle-power.	Consumption of Gas per Hour (Cubic Feet).	Consumption of Petrol per Hour (in Gallons).	Consumption of Petrol per 1,000 Candle-power Hours (in Gallons).	Cost per 1,000 Candle-power Hours. Petrol at 1s. 2d.
1.77	48.6	3.64	.01517	.312	4.36
3.54	54.0	4.31	.01798	.3325	4.65
5.31	76.5	4.38	.01825	.239	3.34
7.09	98.1	4.76	.01980	.202	2.82
9.25	176.1	5.58	.02321	.132	1.85*d.*

In this test the quantity of gas, but not the amount of petrol to make the gas, was measured; hence the consumption scale may not be correct in absolute terms. The scale should also be corrected for differences of pressure, but this can only cause a small error. It will be observed that the efficiency was much greater when using the high pressure. It should be remembered that these tests were on a "saturated" system. High pressures cannot be used with the more modern "safety" gas system owing to the construction of the burner. This, however, should be a matter easily overcome by those interested, and the writer would commend the question of increased pressure to those engaged in this industry.

* This figure must only be taken as approximate, as it was not stated in the test given here. The figure used is taken from other tests where the ratio of petrol consumption to volume of gas was actually measured.

Apparatus Employed for the Generation of Air-gas.

The simplest form of apparatus for the carburetting of air with petrol vapour is known as a *gas fountain.* Fig. 6 shows the scheme employed. A is a cylindrical sheet-iron or zinc vessel having a perforated screen placed some distance from the bottom. Two pipes, B and C, enter at the top. B opens directly into the top, while C passes down and opens below the perforated screen E. The top part of the vessel contains loosely packed wool soaked in petrol. The pipe C is brought down to a burner at D. It is desirable that the "fountain" should be placed at a considerable height above the burner.

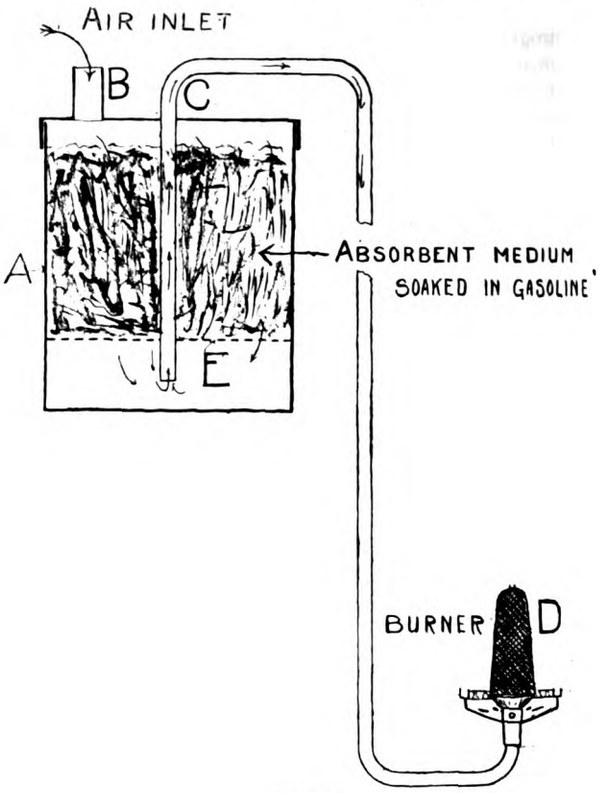


FIG. 6.

The action depends on the simple principle that saturated air-gas is heavier than air, and as a consequence the tube C acts as a syphon drawing in air at B, which, passing through the wool, becomes saturated with vapour and descends to the burner at D. The object of the space at the bottom of the vessel is to prevent liquid not evaporated passing into the pipe. It would, of course, be possible to light several burners off the same supply, but this is not desirable. It is stated by MM. GALINE and ST. PAUL in *L'Eclairage* that a fountain of 5 litres capacity will supply one 15 decimal candle-power burner for seventy hours with one charging. It will be observed that there is no automatic supply of spirit.

It is obvious that in this primitive form of apparatus the quality of the gas generated would be very variable and uncertain, largely dependent on the temperature and atmospheric conditions, and not likely to give very satisfactory results.

One lamp, however, depending on the principle shown in fig. 1 gave considerable satisfaction. It was known as the "Notkin" lamp, and the absorbent medium consisted of a mixture of plaster of Paris and kieselghur, a spirit of about 0.7 specific gravity being used. This lamp

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was, of course, used at first with an ordinary luminous flame or Argand burner, and attempts to use mantles led to a very important improvement. In order to ensure enough air being supplied to the burner it was necessary to cause a draught by means of a long chimney. It was then found that sufficient draught could be obtained by this means not only to draw sufficient secondary air, but also to draw the primary air through an absorbent block without using the syphon action at all. A lamp working on this principle is on the market, known as the "Petrolite" burner. The block, soaked in petrol but having no free liquid, is placed in a container of metal. A draught is started by means of a match held at the base of the chimney, and the air is afterwards drawn through the block simply by means of the chimney draught. An incandescent mantle is used.

From experiments made by a committee of the Royal Scottish Society of Arts it was found that in a lamp of this description one gramme of motor spirit was used per candle-power hour with a mean candle-power of 40 to 45. The consumption thus works out at about 3*d.* per 1,000 candle-power hours with petrol at 10*d.* per gallon. This is a very low figure, considering the size of the unit.

(*To be continued in our issue of November* 18.)

THE ARCHITECTURAL ASSOCIATION.*

(*Concluded from last week.*)

AN interesting and unusual building is Temple Newsam, within four miles of Leeds. As its name tells, it stands on the site of a former Preceptory of Knights Templars. The house is built round an immense courtyard, entirely open on the east side, and derives its striking character from the simplest components. The walls are of brickwork, and, with the exception of a projecting entrance porch facing the court, have no architectural embellishment other than a few stone stringcourses, and a profusion of stone-mullioned and transomed windows of varying proportions. The level balustraded parapet which continues uninterruptedly around the whole building displays a characteristic fancy in the inscription which appears against the sky. It reads, "All Glory and Praise be given to God the Father, the Son, and Holy Ghost on High; Peace upon Earth, Goodwill towards Men; Honour and true Allegiance to our gracious King, loving affections among his Subjects, Health and Plenty within this House." Owing to the destructive action of the Leeds atmosphere the stonework has become very badly perished, some of the balusters being in places little thicker than a lead pencil. All the lettering has been renewed in cast-iron, and many of the balusters and rails in oak. The south front was rebuilt in 1796, and a great deal of interior work has been done by Mr. Bodley, including the grand stairway on the model of Hatfield and Blickling.

About six miles from Leeds in the direction of Harrogate is an interesting group of buildings at Harewood. Within the limits of the Park are the ruins of Harewood Castle, the church, and the mansion which replaces the older Gawthorpe Hall. Harewood Castle is a most interesting ruin, and it is surprising that it appears to have received so little attention. The principal floor consists of a large hall lighted from east to west by square-headed windows with mullions and transoms, and other rooms at the north and south ends. The entrance is by a projecting tower on the east front towards the north, in which the portcullis grooves are clearly visible; over this is a portcullis chamber. To the north of the screens were the kitchen and buttery, beneath which the fall of the ground rendered it possible to form extra rooms, one of which was apparently a guard-room and the other a strong vaulted cellar. Above the portcullis chamber is a small chapel or oratory. At the opposite end of the hall was the dais, with a large fireplace. A wide spiral stair at the east end of the dais led to an upper floor above the hall (as in a Norman castle) and to several storeys of chambers in two square turrets at the south end. The Hall was covered by a pitched roof within the battlements. The Castle was built and fortified in 1367.

Henry Lascelles, a member of an old Yorkshire family, pulled down the Old Gawthorpe Hall and built the new mansion on higher ground near by. The house, which was completed in 1760, is the most considerable work by John Carr of York, but its appearance has been greatly modified by alterations made in 1843 by Sir Charles Barry. Carr's work is well summed up by Professor Blomfield as of correct proportion, "free from affectation, and not particularly ugly." The greater part of the interior decoration and much of the furniture is the work of Robert Adam, in his characteristic and refined manner. It is said that Chippendale was employed on the carving. The strong and weak points of the then current manner are well shown in the design of the entrance lodge to the park, which is a dignified composition with spreading wing walls and railings planned on a reflex curve (like a Greek moulding), connecting the central entrance lodge with two square angle pavilions. Their purpose I know not; possibly it is purely formal, but windows not fitting in with the design are compelled to hide round the corner.

Harewood Church stands some distance north-east of the house. It is of early Perpendicular date, and probably built by the Prior of Bolton, to whom it was appropriated by Lord Lisle in 1383. The plan presents some interesting features, notably the way in which the aisles and nave arcade overlap the western tower, and the narrow, low arches piercing a length of solid wall at the east end of the nave arcade, which latter feature is probably accounted for by the former presence of a rood loft. The nave is without clerestory, and the very lofty arcade in which the archmould dies on to the octagonal shafts without impost mouldings is a telling piece of work, very similar in detail to St. Martin, York. The exterior of the church is rather regular and featureless, possibly owing to a "beautification" which it underwent in 1793. The nave and aisles are both under one low-pitched span, the choir ridge running through at the same level, and it appears that the eastern parapet of the aisles and the side walls and gable of the choir have been altered to effect this. A further restoration took place in 1865.

About three miles from Harewood is the interesting house known as the Nunnery Farm, Arthington. This was built in 1585—it seems from the material of a house of Cluniac nuns founded in mid-twelfth century by Peter of Arthington. The immense number of windows, some of which appear to have been blocked even before the days of the window-tax (judging by internal details), suggest some special purpose, possibly weaving. The initials "T. B." and "I. B." appear in the spandrels of the entrance doorway, but I have been unable to ascertain anything of the builder. The plan shows that the interior arrangements have been considerably modified, but in its general lines it is curiously like Austhorpe Hall more than 100 years later, and in over-all dimensions the two are practically identical. Three interesting modelled plaster ceilings remain, and the parlour has Jacobean panelling.

Ripon (away from the railway station) is a neat, quietly prosperous-looking town with about as much resemblance to a cathedral city as Ely, and rather less ecclesiastical flavour. A church has stood upon the site of the Minster since A.D. 670. St. Wilfrid, Abbot of Ripon, was the first builder, and of his church the crypt remains below the present central tower. A few years later a second church was built, to be again destroyed in 1070. Of this church also the crypt remains. The present church was laid out on unusual lines by Archbishop Roger (1154-1181) as an aisleless nave, central tower, and aisled transept and choir. Owing to its abnormally short nave and the lack of a dominating tower or group of towers, Ripon Minster has a huddled appearance. The east end is a noble composition, and, seen from the lower ground of the churchyard, groups up well. There used to be a most picturesque view from the River Skell, but the demolition of some tumble-down buildings and their replacement by smug modern structures has ruined the group. Towards the west front only a guide-book could possibly be enthusiastic; it is tame and insipid in an extreme degree. Once again the Perpendicular builders (particularly of the north aisle) score heavily, when the virile strength of their work is contrasted with the timid Early English front. We are again forced to ponder the unwisdom of the guide-books which, while extolling the latter, refer slightingly to architecture's utter debasement in the sixteenth century. The internal effect of the Minster is confused, owing to the bungle of piers and arches at the crossing where the change of form in the arches has been left half done. The strong family likeness between the east fronts of Ripon, Guisborough, and Selby has been noted by Mr. Prior in his "Gothic Art."

One other object of interest in Ripon is the small chapel of the Hospital of St. Mary Magdalene, locally known as "The Maudlins," which stands to the north of the town. The almshouses have been twice rebuilt, but the chapel, which is derelict, stands practically as it was left at the

* A paper read at the last meeting of the Architectural Association by Mr. Edwin Gunn.

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suppression of religious houses. Archbishop Thurstan (1114-1141) founded the hospital for secular brethren and sisters and a chaplain, and the chapel is probably his work.

About five miles north-west of Ripon is the village of West Tanfield, picturesquely situated on the banks of the Ure. The present architectural remains of the parish are chiefly connected with the noble family of Marmions. The present remains of the manor house are a gateway tower of the time of Henry V., which is itself a complete dwelling. The present Tanfield Church, which stands hard by the Marmion Tower, consisted originally of a nave, chancel, and north aisle, which probably replaced a Norman church about the middle of the fourteenth century. There is a western tower dating from about 1400, not completed as to its upper stages until about a century later. In 1450 the north aisle was rebuilt to an increased width, its eastern end forming a sepulchral chapel for the Marmions, whose very fine series of tombs are the leading feature of the church. The one which stands detached has an interesting wrought-iron herse.

About four miles north-east from Tanfield lies Kirklington, where the church is interesting. An aisleless Norman nave has had aisles (9 feet wide) added in the fourteenth century, the piercing of the thick walls by arches having apparently been an engineering feat which taxed the capacities of the builders to the utmost and led to some ugly distortions and a curious final effect owing to the clerestory wall, 3 feet 6 inches thick, being carried on octagonal shafts, 1 foot 9 inches in diameter, by chamfered arches. The chancel was added in 1200. Against the south wall are three interesting tombs. Two recessed tombs with effigies of Alexander Mowbray and his wife (1367) are remarkable for their spirited heraldry. Kirklington village was the best we saw, with its spacious central green and fine old trees. The Hall has been much altered at various periods, and when first occupied by Mr. McCall had become a farmhouse. In plan it consists of a long gabled building running north and south, with gabled end projections facing west. The Great Chamber has a modelled ceiling with pendants and a good frieze. The modelling is in relatively high relief, and consists of fruit, shells, monsters, and heraldic devices in panels. It is dated 1570, and bears the initials "C. W. E."—Christopher and Elizabeth Wandersforde.

The magnificent ruins of Fountains Abbey afford a better general idea of the disposition and extent of the buildings of a large monastery than any similar remains in England. The chief reason for this lies probably in the fact that the buildings were first conceived and executed on so noble a scale and in so solid a manner that none of the considerable amendments or extensions since made have obscured the original outlines by capricious or unusual expedients. In common with all Cistercian foundations, the abbey buildings were planked on a site which at its first occupation was a wild uncultivated valley, remote from the habitations of men; chosen as most in harmony with the austere life aimed at by the "Farmer Monks." The original buildings have all the Cistercian austerity and avoidance of display, and conform to the usual practice of the order in the avoidance of a triforium and the absence of western towers in the church, and in the position and form of the chapter-house and refectory. Henry VIII. sold the abbey site and estates to Sir Richard Gresham. It passed, in 1597, to Sir Stephen Proctor, who despoiled the ruins to build his new house near by. It has since passed through various ownerships comparatively unscathed, and is now in the possession of the Marquess of Ripon, under whose directions the site has been swept and garnished, and certain most salutary regulations are enforced for the preservation of its amenities. The general disposition of the abbey buildings within the close is in three connected main groups—the church and conventual buildings, the abbot's house and guesten hall, and the infirmary.

Fountains Hall, which stands against a steeply sloping hillside just outside the west gate of the abbey grounds, is an interesting building. Built in 1611 by Sir Stephen Proctor, of stone obtained from the abbey ruins, it has undergone little change in its external aspect since that day. It is now unoccupied (save by caretakers). The very ingenious means by which the plan is fitted at once to the steep hillside and the symmetrical mass of the building cannot be readily grasped owing to internal alterations. Internally the house was a disappointment, but externally it is charming, despite its coarse and ill-judged detail. The lovely walled terrace garden, continued beyond the entrance roadway, adds immensely to the effect. Many stones from the abbey buildings appear to have been used without reworking—there are some hollowed mullions on the return fronts, and the curious entrance gateway is a medley of shafts and caps, including some with very early carved leafage.

About two miles south of Fountains is Markenfield Hall, the approach to which is over fields and through gates well off the main road. This house was formerly the seat of a family taking their name from the place, whose descendants still lived there in the time of Leland. In 1569, however, Thomas Markenfield forfeited the estate to the Crown after taking part in the "Rising of the North," and the house is now a farm. A finer instance of a mediæval moated manor could not be wished for, though the building, as several observers have noted, is more of a southern than a northern type. The chief part is of fourteenth-century date, and has been remarkably little altered. License to crenellate was obtained in 1310. Crenellation is no figure of speech in this case; the battlements pierced with sillets are quite in working order, but the roofing within them is modern. The moat completely encircles the house, and the only approach is by a stone bridge communicating with the late Tudor gatehouse and by a light wooden bridge behind. The whole of one wing is occupied by the hall with the solar, at the daïs end, filling the angle of the "L" with a protecting garderobe attached, the chapel and rooms, which are possibly priests' rooms, adjoining on the south. All these rooms are on the first floor. The chapel has a good traceried east window and a piscina, and the hall windows are also good. The original approach to the principal floor was by an external staircase, which has been destroyed, but the weathermould of its roof can be seen. The later building, projecting westward, is a kitchen, and its embattled chimney and curiously gathered coping are interesting, as also a fine series of shields ranged in a line below the eaves—a simple and effective treatment. In the building attached to the south-east angle of the chapel wing are two fourteenth-century doorways with very deep three-quarter hollows. The gatehouse is a delightful little building approached by a stone bridge spanning the moat.

About four miles south of Markenfield Hall lies the village of Ripley. Here the castle is not of great interest, but the church presents points of similarity to certain features at Harewood and Kirklington. What principally excited members' curiosity, however, was the remarkable object in the churchyard, said to be the base of a weeping cross.

Mr. Arthur Keen, the President, called upon Mr. J. Johnson to open the discussion as being the one member who had attended every one of the Association's forty-one excursions.

Mr. J. Johnson said it gave him great pleasure to propose a vote of thanks to Mr. Edwin Gunn for his paper, which must have cost a large amount of trouble. York was, of course, a great centre; yet somehow or other there seemed to be something lacking, although the many buildings visited were all of considerable interest. It was a pity that there had not been more members on the excursion. Those who had joined were able to enjoy going over the ground again with Mr. Gunn. He (Mr. Johnson) had been greatly impressed by the remains of Fountains Abbey, which showed how long good building will endure. The remains are very well kept and preserved. Members of the Architectural Association should, whatever else they do, go to Fountains Abbey. The domestic work seen on the excursion was strong, plain, and simple. It was open to doubt whether Harewood House (which was completed in 1760 from the designs of John Carr) was improved when restored by Barry in 1843. The interior work and the decorations were particularly good, not being so feeble and thin as is sometimes seen.

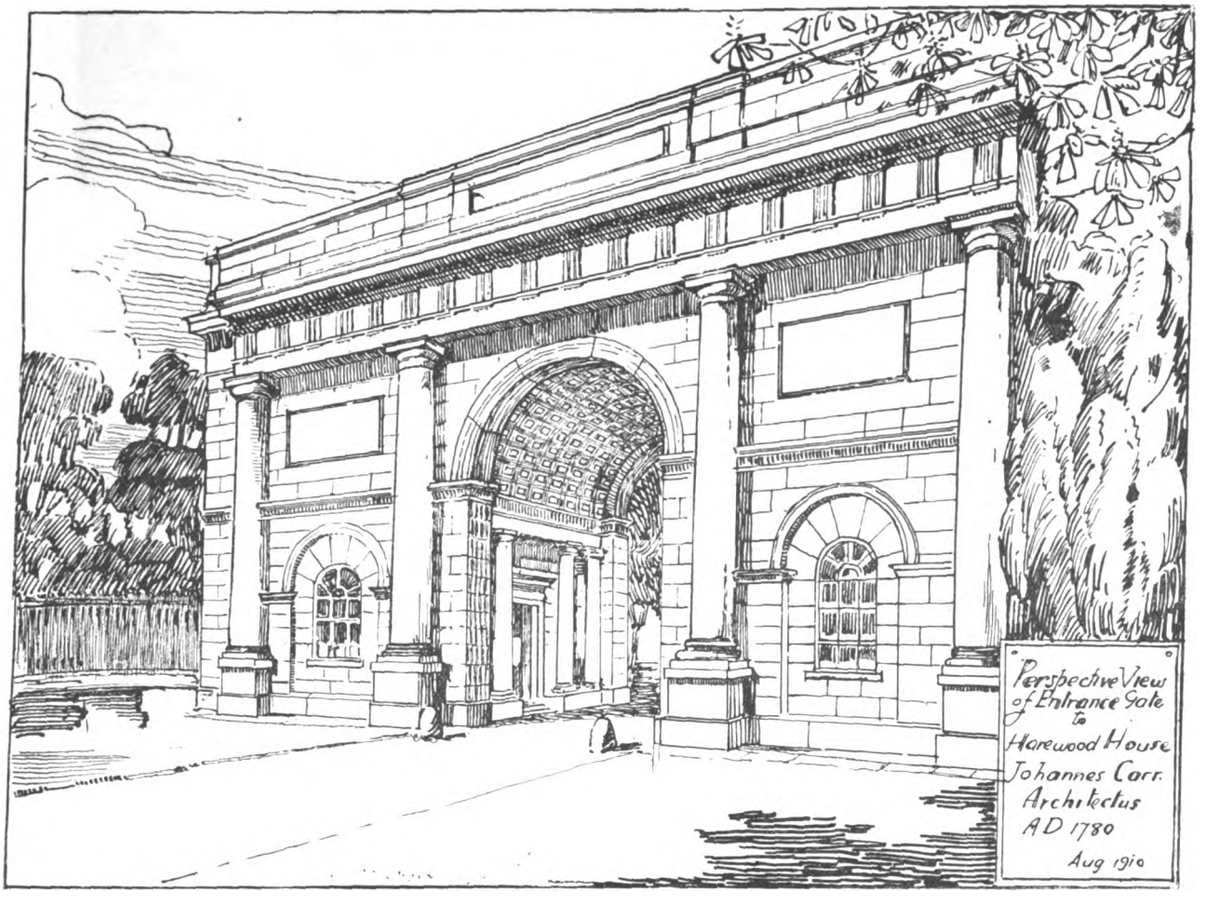
Mr. Louis Ambler said he felt particularly interested in this subject, being a Yorkshireman. He had wanted to go on the excursion, but was prevented from doing so. Mr. Gunn had, in his paper, covered such an enormous field and described the buildings so very minutely that no one else would hardly like to tackle that particular subject. Mr. Ambler stated that with a single exception he knew every one of the buildings mentioned. It was a pity that no general view had been shown of the King's Manor at York, which is very picturesque—the stone dormers, he believed, were unique in Yorkshire. Mr. Gunn had criticised rather severely the front of Treasurer's House, saying that on either side of the doorway a single Ionic pilaster carrying nothing is placed above coupled Doric columns, all having very weird details. But they must remember that the house had been very much pulled about. He would like to hear if the members had found at Austhorpe Hall any traces of an earlier building. The present hall is almost unique in that part of Yorkshire, and might be called an Inigo Jones hall. That architectural tradition con-

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tinued to the seventeenth century, and even as late as 1715 we find houses being erected with stone mullioned windows, some of the smaller ones being five, six, or seven lights wide. Mr. Gunn, in speaking of Temple Newsam, had mentioned that the estate passed by sale to Sir Arthur Ingram, who built the present house in 1630, and that the line continued by female descent down to the late Mr. Meynell-Ingram, whose widow recently disposed of the estate to Mr. Wood, son of Lord Halifax. This Mr. Wood, however, was himself a nephew of Mrs. Meynell-Ingram. Harewood House had certainly not been improved, in his opinion, by Barry's additions, for to him Carr's original design was preferable. Mr. Ambler regretted that the excursions had not permitted of the members visiting some of the houses which were more particularly peculiar to Yorkshire, such as those in Airedale and Wharfedale. The Nunnery Farm at Arthington is an extremely interesting building, erected on the site of a structure hundreds of years older. The main staircase here, unlike that at Austhorpe Hall, comes down to the ground floor. The initials T. B. and I. B. in the spandrels of the entrance doorway, which puzzled Mr. Gunn, referred in his opinion to Brigg or Briggs, who aid of the motors, there had been arranged a most magnificent programme. There were included types of every sort of mediæval house and of later ones like Austhorpe Hall. Then, of course, they saw the later large mansions of the country. The district was also rich in ecclesiastical work, including the cathedrals of York and Ripon and Fountains Abbey. The latter building set an example to every owner of how to keep ruins in their charge in decent and proper order. All about the grounds, moreover, are large plans, indicating even to the ordinary layman the position the various buildings occupied. Everything was honoured and kept up in an exemplary fashion.

Mr. C. E. Bateman said that the large amount of matter contained in the paper brought back to their minds what they had seen on the excursions. He would advise every student to save up his money in order to attend the next one.

Mr. Arthur Keen, the President, remarked that Mr. Gunn had left very little for others to say, and very little time to say it in. With regard to Austhorpe Hall, the missing main staircase could be found in a house a few miles away. Although Mr. Norman Shaw was generally reported to have



were supposed to be the family who occupied it. In this part of the country the gables are usually flat-pitched or straight. The pitch appears in different parts of the county; in the West Riding it is lower than in the North or East Riding. But in the latter part they are not particularly characteristic of Yorkshire. It was a pity that the party did not go to such a typical example as East Riddlesden Hall.

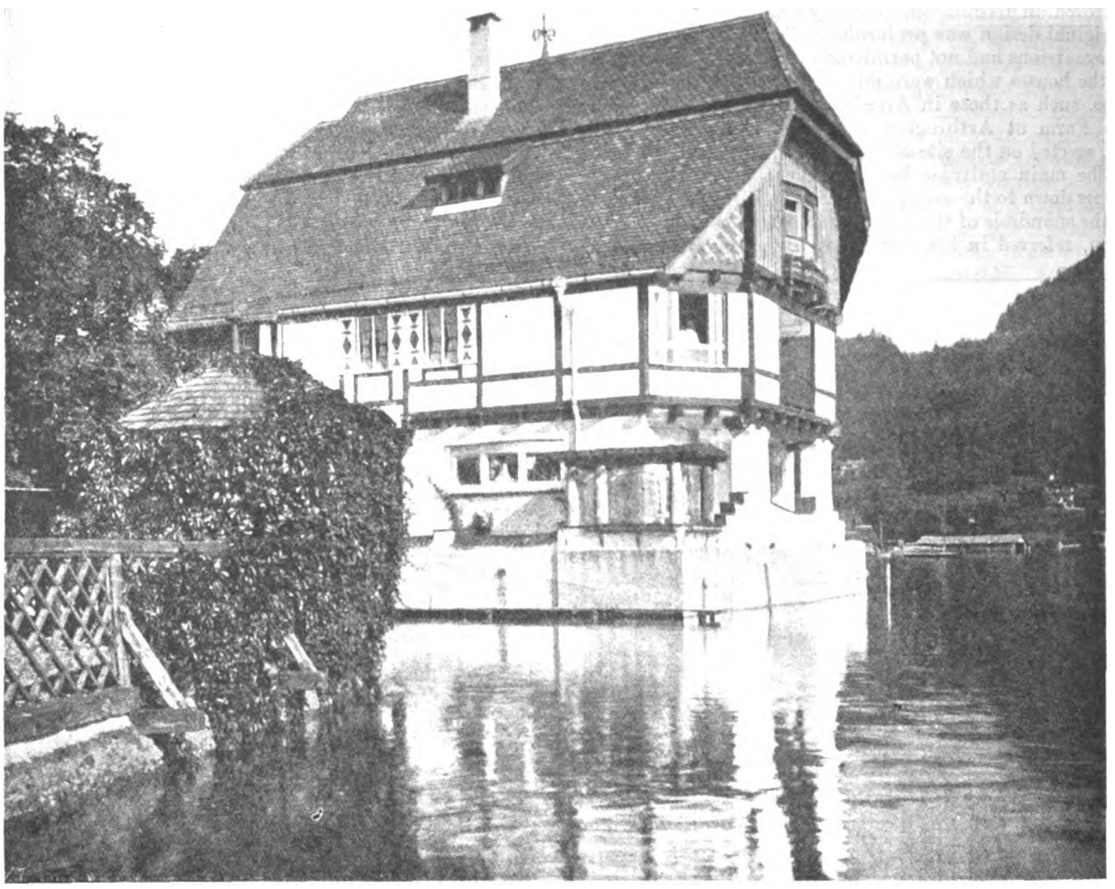
Mr. F. Dare Clapham remarked that he was especially willing to support the vote of thanks because he could claim that it was his own suggestion that a paper on the excursions should be read annually. He considered that those who had not had an opportunity of attending should have an opportunity later of seeing everything. This year they had been so hurried about that he could not understand how Mr. Gunn had found the time to make the necessary notes. In some places, most especially in York, some of them were done up long before the programme was carried out. It was probably the first time in the history of the excursions that the new mode of locomotion had been used, viz., motor char-à-bancs. Through their means they were enabled to visit the outlying places. Hitherto it had always been put forth as an excuse that the distances between the places of interest were so great that it was impossible to entertain the thought of Yorkshire as a centre. Whereas this year, with the taken down the cresting on the screen in St. John's Church, Leeds, it was doubtful if he had done so, for a drawing he published at the time of his restoration of the building showed the cresting. It consequently appeared as if someone else was to be held responsible for the removal. Something might have been said of the heraldry and lettering introduced in the architecture of the places visited. At Harewood Castle, for example, the only architectural detail was the outcome of heraldry and the use of the motto. At York the city gates, which are the town's distinguishing characteristics, were enriched with a small quantity of heraldry, which makes a most effective decoration on the broad surface of the wall.

The vote of thanks was then passed with acclamation.

Mr. Edwin Gunn, in reply, said he was extremely pleased at the presence of Mr. Ambler, and could only regret that with his intimate local knowledge he (Mr. Ambler) could not have read the paper. It was exceedingly unfortunate that there had only been one photograph to exhibit of the King's Manor, York. Austhorpe Hall constituted the success of the excursion. That building was a discovery of Mr. Hennings, and no one expected it. To Mr. Hennings special thanks were due for his photographs. A good series of measured drawings of Swinsty Hall, by Mr. Martin S. Briggs, had appeared in *The Architect*.

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MODERN EUROPEAN ARCHITECTURE.
BOHEMIA.



[From *Der Architekt.*

A VILLA IN A LAKE, ST. GILGEN.—Professor JAN KOTERA, Architect.

SUGGESTED MEMORIAL TO KING EDWARD VII.

THERE are numerous schemes for a London Memorial to His late Majesty King Edward VII. under consideration by the influential committee. The scheme put forward by Lord Tenterden certainly deserves special attention. The first part of the proposal is to use the Crystal Palace as the headquarters of a National Aero Corps to be established for the purpose of promoting national aerial defence. Part of the Palace would be converted, we understand, into a permanent exhibition of all appliances pertaining to aviation. A far more important suggestion, however, is the founding of an Aviation School, where instruction would be given in the theory, construction, and management of aeroplanes, &c. Lovers of the Crystal Palace and the Crystal Palace concerts will be reassured by the statement that it is not suggested to in any way interfere with their pleasure. The centre transept would still be available for entertainment and other purposes. The many thousands who enjoy the grounds have likewise been considered, for it is suggested to keep up the gardens; in fact, the intention is to improve upon them. In connection with the scheme it is proposed to construct from London to the Crystal Palace a high-speed electric railway in as direct a line as possible from the West Central district, and with only a few intervening stations. The two schemes combined are excellent suggestions for commemorating our late Gracious King, whose interest was ever on the side of progress. British inventors and British manufacturers have to look to their laurels. Much progress was made in the late reign in flying, but much more has to be done if Great Britain is to hold her own in the front rank of aviation. This can only be achieved by study, experiment, and perseverance. A place must, however, be found where such preparation can be indulged in. For this purpose what better place could be found than the Palace? Sooner or later some such provision will have to be made. Why not now? The Crystal Palace as a place of amusement is more or less unsuccessful, but its possibilities as outlined in Lord Tenterden's two schemes are enormous. Properly managed, the Palace might be made more than self-supporting. It is to be hoped that both schemes will be adopted.

A STUDY OF BASE AND BEARING PLATES FOR COLUMNS AND BEAMS.

By N. CLIFFORD RICKER, Professor of Architecture, University of Illinois.

(*Continued from page* 239.)

IT now remains to determine this per cent. for any other value of n.

The graphical table in fig. 16 is readily computed and plotted from the data obtained in fig. 15. It is used as follows:—

Let @ = per cent. of resistance moment of a rectangular fracture section, which is possessed by a tapered section with the same thickness t and the same value of n.

Example 1.—Let $t' = 0.3\ t$ = edge thickness and $n = 2$.

A vertical through 2 in fig. 16 intersects the curve 0.3 on a horizontal through 70.5 at the left, which is the required per cent.

Example 2.—Let $t' = 2.5$ and $n = 3.5$.

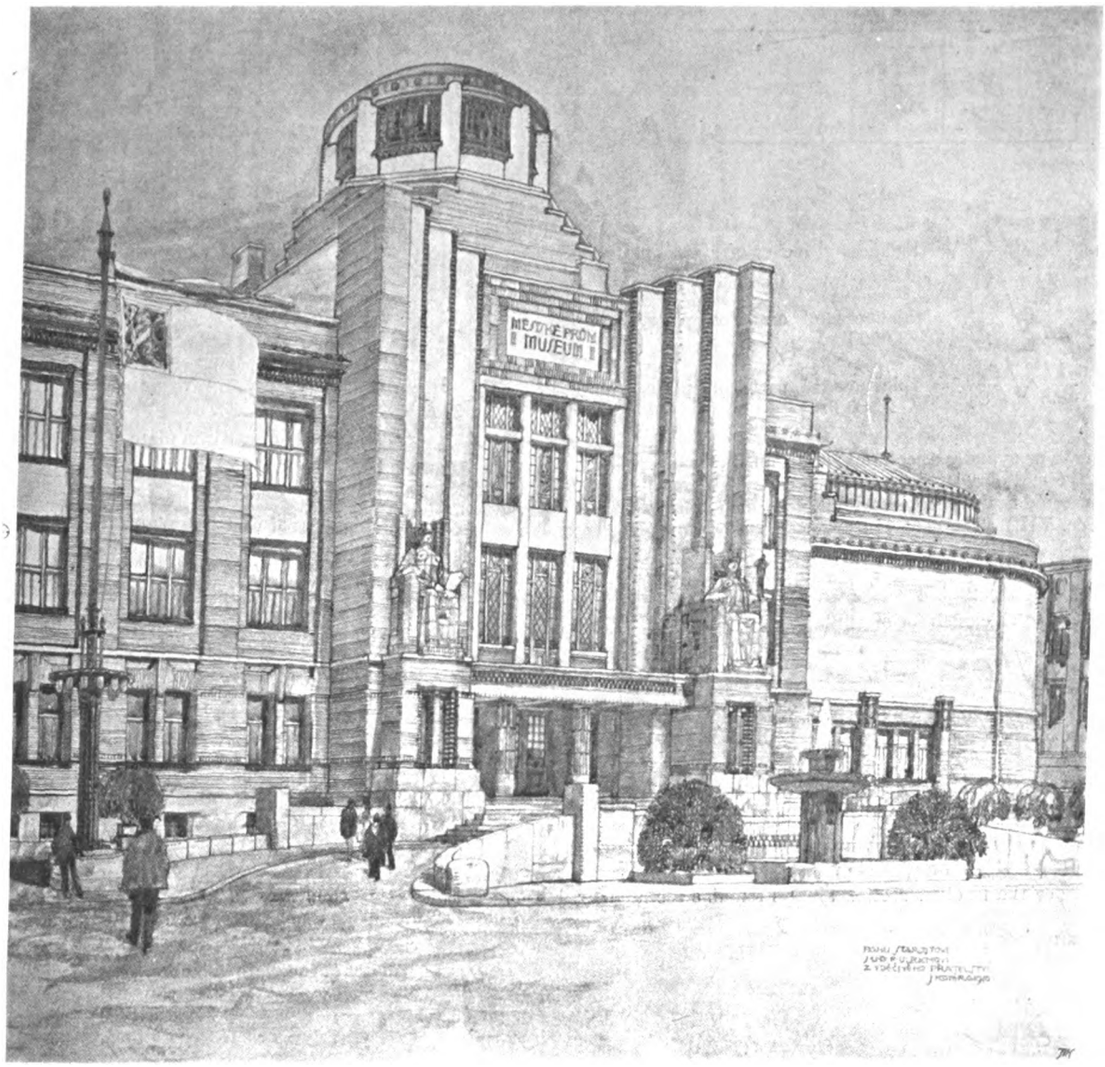
A vertical through 3.5 intersects the interpolated curve 2.5 on a horizontal through 70.2 at the left, the required per cent.

It is further evident that the actual thickness t of a tapered plate must be somewhat greater than that of a plate of uniform

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MODERN EUROPEAN ARCHITECTURE.

BOHEMIA.



[From *Der Architekt.*

DESIGN FOR A MUSEUM.—By Professor JAN KOTĚRA, of Prague.

thickness, when both are required to possess equal resistance moments.

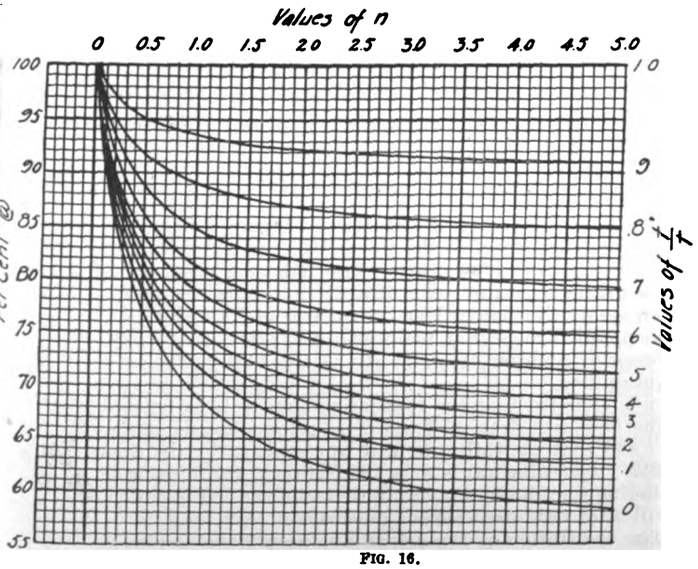


FIG. 16.

The general formula for base plates is :—

$$t = \sqrt{\frac{3P}{fB}(L' - L'')} =$$

thickness in inches for a plate of uniform thickness. (10)

Or $$t = \frac{1}{50}\sqrt{\frac{3P}{B}(L' - L'')} =$$

thickness for a cast-iron plate. (11)

Let @ = per cent. corresponding to $\frac{t'}{t}$ and n, found by table (fig. 16).

Then for cast iron, $t = \sqrt{\frac{100}{@}}\frac{1}{50}\sqrt{\frac{3P}{B}(L' - L'')}$ = required thickness t under the column for a tapered cast-iron plate, possessing a resistance moment equal to that of a plate of uniform thickness t determined by formula 11. (12)

X.—COMPLETE FORMULAS FOR PLATES OF UNIFORM THICKNESS.

By equating the resultant bending and safe resistant moments acting about the neutral axis of the fracture section of the plate the following general formulas are obtained :—

The primary formula is :—

$$M = \frac{P}{2}(L' - L'') = R = \frac{fI}{c}. \quad (13)$$

(*a*) Bearing plate on wall (fig. 17)

Let d = width in inches of the plate, usually equal to the thickness of the wall.

Then $$\frac{P}{2}(L' - L'') = \frac{fdt^2}{6}.$$

Or $$\frac{Pnk}{4} = \frac{fdt^2}{6}.$$

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Hence $t = \sqrt{\frac{3\,Pnk}{2\,fd}}$ = thickness of the plate in inches. (14)

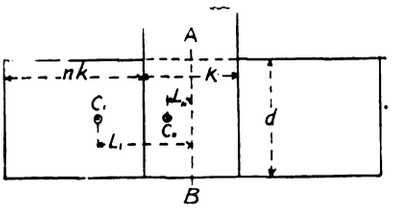


FIG. 17.

And $t = \frac{1}{103.3}\sqrt{\frac{Pnk}{d}}$ = thickness in inches of a steel plate. (15)

$t = \frac{1}{44.7}\sqrt{\frac{Pnk}{d}}$ = thickness of cast-iron plate, f = 3,000 lbs. (16)

$t = \frac{1}{40.8}\sqrt{\frac{Pnk}{d}}$ = thickness of cast-iron plate, f = 2,500 lbs. (17)

If a square or cylindrical column stands on the bearing plate instead of the end of a beam resting thereon, L'' is to be found and then inserted in the general formula, by which t may then be found. (Sec. VII.) The general formulas then become :—

$t = \frac{1}{103.3}\sqrt{\frac{P}{d}\left(\frac{nk}{2} + \frac{k}{4} - L''\right)} =$
thickness for steel plate. (18)

$t = \frac{1}{44.7}\sqrt{\frac{P}{d}\left(\frac{nk}{2} + \frac{k}{4} - L''\right)} =$
thickness for cast iron, f = 3.000 lbs. (19)

$t = \frac{1}{40.8}\sqrt{\frac{P}{d}\left(\frac{nk}{2} + \frac{k}{4} - L''\right)} =$
thickness for cast iron, f = 2,500 lbs. (20)

Formulas 16, 17, 19, and 20 are also applicable to cast-iron bearing plates tapered in thickness from beam or column to each end, since the fracture section always remains rectangular in form.

(*b*) Square plate (fig. 18).

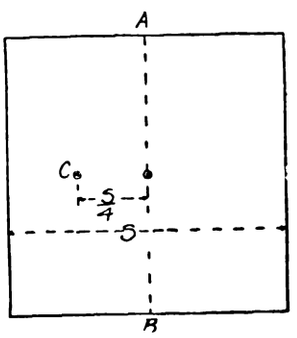


FIG. 18.

Let S = side of square plate in inches.

Then $t = \sqrt{\frac{3\,P}{fS}\left(\frac{S}{4} - L''\right)}$ = thickness of plate in inches. (21)

$t = \frac{1}{73}\sqrt{\frac{P}{S}\left(\frac{S}{4} - L''\right)} =$
thickness of steel plate in inches. (22)

$t = \frac{1}{31.6}\sqrt{\frac{P}{S}\left(\frac{S}{4} - L''\right)} =$
thickness for cast iron, f = 3,000 lbs. (23)

$t = \frac{1}{28.9}\sqrt{\frac{P}{S}\left(\frac{S}{4} - L''\right)} =$
thickness for cast iron, f = 2,500 lbs. (24)

Let D = inscribed diameter of octagon.
$L' = .2187D$.

(*c*) Octagonal plate (fig. 19).

$t = \sqrt{\frac{3\,P}{fD}(.2187D - L'')} =$
thickness of plate in inches. (25)

$t = \frac{1}{73}\sqrt{\frac{P}{D}(.2187D - L'')} =$
thickness of steel plate. (26)

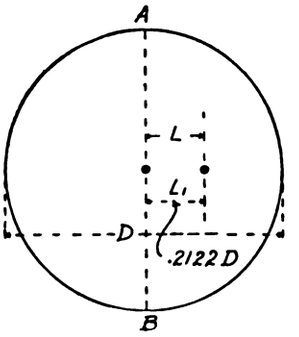


FIG. 19.

$t = \frac{1}{31.6}\sqrt{\frac{P}{D}(.2187D - L'')} =$
thickness of cast-iron plate, f = 3,000 lbs. (27)

$t = \frac{1}{28.9}\sqrt{\frac{P}{D}(.2187D - L'')} =$
thickness of cast-iron plate, f = 2,500 lbs. (28)

(*d*) Circular plate (fig. 20).

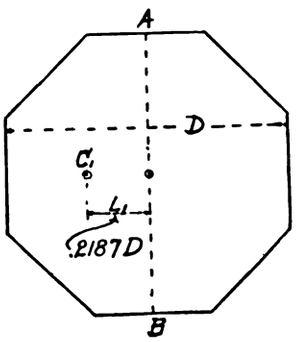


FIG. 20.

Let D = diameter of the plate in inches.
$L' = .2122D$.

$t = \sqrt{\frac{3\,P}{fD}(.2122D - L'')} =$
thickness of the plate. (29)

$t = \frac{1}{73}\sqrt{\frac{P}{D}(.2122D - L'')} =$
thickness for steel plate. (30)

$t = \frac{1}{31.6}\sqrt{\frac{P}{D}(.2122D - L'')} =$
thickness for cast iron, f = 3,000 lbs. (31)

$t = \frac{1}{28.9}\sqrt{\frac{P}{D}(.2122D - L'')} =$
thickness for cast iron, f = 2,500 lbs. (32)

(To be continued.)

MR. WILLIAM J. LEECH and Mr. T. Manly Deane have been elected Associates of the Royal Hibernian Academy to fill vacancies caused by death. The following elections to professorships for the year 1910-11 have also been approved :—Mr. Nathaniel Hone, Professor of Painting; Mr. O. Sheppard, Professor of Sculpture; Mr. Albert E. Murray, Professor of Architecture; and Mr. George Coffey, Professor of Antiquities.

IT is expected that the foundation work will be finished on the new cathedral in Valparaiso before the end of the year, and that the cathedral will be completed by the close of 1912. The cathedral is to be 195 feet long, 162.5 feet wide (including the transepts), with a central dome 130 feet high. It will be of reinforced cement construction.

THE Institution of Municipal Engineers have decided to award two premiums—one of which has been presented by the President—annually for the best original papers read by members or students before meetings of the Institution.

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The Architect.

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FORTHCOMING EVENTS.

Friday, November 11.

University College, London : Professor F. J. Haverfield on "Greek and Roman Town Planning."

Glasgow Technical College Architectural Craftsmen's Society : Debate on "The Business Relations of the Architect, Measurer, Master of Works and Contractor."

Monday, November 14.

Architectural Association : Mr. Gerald C. Horsley on "That Fine Draughtsmanship conduces to Fine Architecture."

Surveyors' Institution : Presidential Address by Mr. Leslie Vigers.

London Institution : Mr. A. G. Temple on "The Pre-Raphaelite Movement in England."

Wednesday, November 16.

Society of Architects : Conversazione at 28 Bedford Square, W.C., and opening of Society's Premises.

Thursday, November 17.

University College, London : Mr. J. A. Gotch on English Domestic Work; Lecture (3) on "The Homes of Queen Elizabeth's Courtiers—Exteriors."

TECHNICAL EDUCATION.

THAT all is not well with the present condition of technical education in regard to the building trade is clear from the proceedings of the recent meeting of the Building Section of the Association of Teachers in Technical Institutions. Our own observation and experience teach the same fact, though not from the same point of view.

In an address to the members of the Building Section Mr. J. WILSON, President of the Association, dealt with some of the points, in which he considered that improvement is desirable to advance the progress of technical education in general, and, therefore, inclusively, the development of instruction in building subjects and the building trades. These were: (1) Better preliminary training of students; (2) increase of the number of students in technical schools; (3) institution of specialised "trades schools," or "technical secondary schools."

The underlying idea of this position is that to increase the number of students in the technical schools and their ability to profit by the technical instruction given, means should be provided for bridging the hiatus in the present educational system between the public elementary school and the technical institution. This is the crux of the whole matter. The boy leaves the public elementary school at the age of 14; the technical institution does not want him till he is 17.

When the boy leaves the public elementary school at 14 he can earn five shillings a week. How are the parents of this boy to be induced to forgo this earning? It is not to the boy's ultimate advantage, nor to that of the nation, that he should join the ranks of unskilled and easy labour, from which after a few years he will be displaced by other boys, and then be forced into the ranks of casual labourers, unemployed, or, worse still, unemployables.

The Association of Teachers suggest a rise in the leaving age, practical or "constructive" education during the additional period, and compulsory attendance at an intermediate training school between the elementary school and the technical institution.

If apprenticeship is to be entirely abolished in favour of the training of skilled labour in technical institutions, some such scheme seems inevitable; but the necessity is a strong indictment of the system of technical institutions. The apprenticeship method had this advantage—that the boy spent his five-shillings-a-week period in the trade for which he was afterwards to be a journeyman. He gradually became more valuable to his employer, and so, although he might receive more pay—whether in cash or in food, lodging, and clothing—at the beginning of his apprenticeship than he was worth, the master was recouped during the latter years.

The rock-bottom principle of the technical institution is that when the student leaves its doors he is a competent journeyman, and the only real justification for preference over the apprenticeship system is that he is a better journeyman. The weak point in the technical education scheme at present is that it does not assist the parent of the future skilled artisan or craftsman to maintain the boy whilst he is learning his trade, as did the old apprenticeship system. The class from which our skilled artisans were drawn in the past, and are drawn at present, cannot afford the whole burden of the maintenance of the boys during their years of comparatively inefficient and low-value labour.

There appear, therefore, only two solutions of the economic problem, if the technical education scheme is to be continued: either the skilled artisans must be drawn from a class who can afford to maintain their boys without extraneous pecuniary aid during their training, or the parents who cannot afford this must be assisted by the State. The former of these classes, whom it is usual to call the middle class, never have been content, and probably never will be so, to keep their boys in unremunerative positions for several years, unless with the hope that afterwards they may be fitted to occupy a higher sphere than that of the skilled artisan—that they may become employers, or at least superintendents, of the artisan, captains of industry in some degree.

The Association of Teachers in technical institutions suggest compulsory attendance at continuation schools, with limitation of the hours of labour of adolescents, and more scholarships with maintenance grants for technical students. That means that by legislation and taxation the artisan class is to be forced to pay more than they have hitherto done for the training of their boys by a reduction of their small wage-earning capacity on leaving the elementary school, and the middle class is to be compelled to pay for the balance of the cost of maintenance and instruction of the skilled artisans for a certain number of years, during which they are unproductive.

Is such a scheme practicable? A boy leaves the public elementary school at 14, and it is settled that he is to be a joiner. In the old days he would go into a joiner's workshop as apprentice. Now he is not to be allowed to work all day at any calling, but is to be a half-timer. During his half-day at work it would obviously be desirable that he should be in a joiner's workshop and not an office boy, van boy, or messenger. It would be, therefore, necessary to confine the technical training of boys in any particular trade to those who were engaged in that trade, as is already done in some technical schools. The masters in that trade would, therefore, undergo inconvenience and pecuniary loss, which would be at its maximum if all the boys were at

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TOWER OF ST. JACQUE, ANTWERP.

school in either the morning or the afternoon, and could only be reduced to lesser proportions by half the boys being at work and half at school at any one time—that is, one boy would be working at a job for part of the day and another for the remainder. This spells trouble, worry, and loss, and there is nothing to compensate the master for the abolition of the apprenticeship system unless the boy is bound to continue in his service when he has become valuable.

Thus we come back virtually to the system of apprenticeship, and this we think to be the solution of the problem. Let the boy be bound to give his working hours to a master in the trade he is learning for a certain period, during which the indenture should prescribe the time for school and the time for the shop, as well as the rate of pay, which should be regulated by efficiency, and should be such as to recoup the master during the latter period of training for the loss sustained earlier. Then the continued existence of the technical institution would depend upon its ability to turn out a better workman than the apprenticeship system.

Among the matters referred to in the discussion following Mr. WILSON'S paper was the want of co-operation of architects, employers, and trade unions with technical schools. This want in our experience is due to the fact that up to the present, at any rate in the building trade, the technical schools are not turning out superior workmen to those produced by the apprenticeship system. When the schools can show craftsmen who can work better and quicker than the old-time journeyman they will not need to complain of any want of co-operation or appreciation from architects and employers. What the trade unions will say is another matter.

The Building Section also consider that among the things that require reconsideration and adjustment by the responsible authorities is the relationship of the teaching of architecture to the teaching of building construction in technical schools. As to this we are quite certain that the attempt to teach architecture in the technical schools is a huge mistake. The Architectural Association and the Schools for Architects now in existence at several of our universities provide all the instruction outside of a practising architect's office that is necessary for young men who intend to become architects, and do it excellently well. The technical schools—and we speak from considerable experience—give only part of the instruction, and do it very badly. They might be useful to architectural students if these were allowed to attend classes for operative skilled workmen simply as onlookers, to learn how work in the various building trades ought to be done, and how to distinguish between good and bad work or material; but there is no need for, and, we think, in our day no advantage in, young architects learning the handicraft of the building trades.

"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

WE regret to find that the number of workers has dwindled down until for October we have received only one set of drawings. These are from "LOIDIS," and contain a study of a groined vault from the south porch of Howden Church, Yorkshire. The study includes plan, with projections of the various ribs and of the infilling of the severies, and two sections and details of mouldings, and is a thoroughly workmanlike performance. Despite the lack of competitors we have, therefore awarded the prize to "LOIDIS."

NOTES AND COMMENTS.

THE General Committee of the London Memorial to King EDWARD has not advanced very far in its deliberations at present. The 164 proposals or suggestions made by all sorts of people had been weeded down by the Executive Committee to, first and foremost, a statue, with either an historical museum for London or a great hall for the University of London. At the last moment, however, further proposals have come in: first, Lord NORTHCOTE'S scheme "for the protection of human life in the tropics by a great extension of that campaign against tropical disease which has already abated so largely the sum of human suffering"; second, a suggestion for the abolition of Charing Cross railway station and bridge, and the substitution of a fine bridge with good approaches on both sides of the river. The Executive Committee has stultified itself to some extent by asking that its report be referred back, but it is better to do this when a good idea occurs at the last moment rather than do something less good than might have been done.

WE strongly agree with the feeling that the memorial should be something that people can look at, and something peculiar to London. The reduction of tropical disease is a grand work for humanity, but is it greater than the abolition of the "white scourge," and is a London memorial to King EDWARD—and that is what the Committee have in hand, thanks to the Government—more appropriately directed to the tropical diseases than to the two great perils of Londoners, consumption and cancer? Tropical medicine has far less to do with London than either of these, it is an Imperial affair, and the memorial with which the Mansion House Fund is concerned is a London memorial.

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THE campaign against tropical disease is something that is not before the eyes of every Londoner, and an adoption of Lord NORTHCOTE'S scheme would, we are sure, be fatal to the success of the memorial. Thus, following the weeding out of the Executive Committee, there are now only three schemes which are worthy of consideration as a MEMORIAL—the historical museum, the hall for London University, and the Charing Cross bridge. Of these, it is our opinion that as a memorial—and that is what the Committee have to consider—the Charing Cross bridge, so well explained and advocated in the *Times* of Monday last, is far and away superior to the other two suggestions. It affords scope for a really fine piece of civic beautification, for something strongly appealing to every beholder as a token of the high regard and love of Londoners for the memory of King EDWARD. We want an historical museum for London, and London University wants a hall, but these appeal only to sections of London's inhabitants, whereas the grand bridge fills a practical want for all Londoners, and would be a pride and enjoyment for all.

MR. EVAN SPICER has throughout his connection with the London County Council had no small share in determining the efforts made by the Council to make London more beautiful, and his proposal that the Council should provide a sum of about 10,000*l.* yearly for the definite purpose of acquiring pictures, sculptures, statuary, woodwork, ironwork, and other objects of fine and applied art is one that is not only in accord with Mr. SPICER'S past history, but is characterised by sound business common-sense.

A BEAUTIFUL city or a city that contains beautiful things is of advantage to the citizens in two ways—it improves their happiness and their *morale*, and fits them to do better work, to increase the value of their physical as well as mental output; and it attracts visitors, who, in seeking to enjoy that beauty, bring hard cash into the pockets of the citizens. London has in the last quarter of a century vastly increased its attractiveness for visitors, and now bids fair to vie with Paris, Vienna, and Buda-Pest as a centre for those who would fain enjoy the amenities of life that it offers. The expenditure of money in increasing the beauty within a city is therefore a sound business investment of capital.

MR. SPICER'S proposal that the London County Council should ask for the assistance of an advisory committee, which should include representatives of the Royal Academy of Arts, the Royal Institute of British Architects, and other institutions, is a wise one. All the members of the Council have not the good taste of Mr. SPICER in the appreciation of the beautiful, and if money is to be spent wisely in adding to the attractive beauty to be found in London it is only common-sense that good advice should be forthcoming.

THE proposal that the London County Council should rebuild Lambeth Bridge comes none too soon. Never a good and well-designed structure, it has steadily increased in inefficiency until in June last it was closed to vehicular traffic in the interests of public safety. The Improvements Committee recommends the rebuilding of the bridge as a steel arch bridge 60 feet wide, with two footways, each 12 feet wide, and a carriage-way 36 feet wide. The total cost is estimated at half a million sterling, which would include paving work on the approaches, and would be spread over seven years. We hope that care will be taken to make the bridge beautiful as well as useful.

WE regret to learn that the negotiations for taking the Town-Planning Exhibition from London to Edinburgh have fallen through, but there is a chance that the northern capital may next year have a Scottish Town-Planning Exhibition of its own. The collection gathered by Professor PATRICK GEDDES should form a good nucleus. There is no doubt, as Sir GEORGE MACCRAE said at a recent meeting of the Edinburgh Health League, that great interest was being taken in the Town Planning Act by the authorities in Scotland; and when he told them that the Local Government Board were in negotiation with regard to schemes in places so divergent in their interests as Dundee, Dunfermline, Buckhaven, Gourock, and Greenock, they would understand that the interest in the Town Planning Act was very real indeed. The man in the street was taking a great interest in the Act. He could say this for the Local Government Board, that all the assistance that they could give would be gladly given to that end. The local authorities, both burgh and county, had a great responsibility in this matter. The burghs, with their slums and possible city extensions, had a power placed in their hands by which they could safeguard at the same time the health of the community and the financial interest of the ratepayers. He should like to see every large town—and Edinburgh had an opportunity of taking the lead—map out their possible extensions in future town plans. He was very much struck when he was on the Continent visiting some of the German towns, and more especially Vienna, how there they were looking far ahead. They had their plans arranged so that when the landowner came to construct new streets or to erect new buildings they had their plan there, and his ideas had to conform to what the local authority desired. And the counties also had a great responsibility in this matter. They had in Scotland many mining villages which required to be remodelled, if not demolished altogether, and by the new Town Planning Act the counties had great powers entrusted to them. If they wished an example of how a mining village could be created under sweet and pleasant conditions, he commended them to visit the new mining village of Woodlands, five miles from Doncaster, where they would see what could be done.

NOT only in the planning of town extensions, but in dealing with existing evils, the Housing and Town Planning Act has already had good effect, and the Local Government Board has issued the following communication with reference to the Housing of the Working Classes Acts, 1890 to 1909 (closing of houses unfit for human habitation): The returns received by the Local Government Board from local authorities in England and Wales for the year ended March 31, 1910, furnish some interesting information in regard to the closing of dwelling-houses. Previous to December 3, 1909, the date on which the Housing, Town Planning, &c., Act became law, closing orders as regards such houses could only be made by justices on proceedings taken by the local authority. The effect of the Act of 1909, however, was to enable local authorities to make such orders, a right of appeal to the Local Government Board being at the same time conferred on the owners of the houses. During the year ended March 31, 1909, 587 closing orders were obtained by local authorities; but although the returns for the year ended on March 31, 1910, are not quite complete, it appears that no less than 1,500 such orders were obtained or made during that year by local authorities, being an increase of 913, or 150 per cent., upon the closing orders of 1908-9. Of these 1,500 orders, 775 were obtained from justices in eight months from April 1 to December 3, 1909, thus showing a substantial increase in that period alone over the number of orders obtained during the previous twelve months. The remaining 725 orders were made by local authorities in the four months December, 1909, to March, 1910. These figures seem to indicate not only that the discussion in Parliament and elsewhere of the principles embodied in the Act of 1909 had a stimulating effect on the action of local authorities in this matter, but also that the transfer from the justices to the local authorities of the power of making closing orders had an immediate effect in securing increased activity. In respect of those 725 orders, the Local Government Board received appeals against the action of the local authorities as regards only two houses.

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PROFESSOR ADSHEAD, in a lecture delivered at Sheffield in connection with the Health and Home Exhibition, treated of the decentralisation of large towns, and one of the principal parts of his lecture dealt with the clearing away of the slum area and the substitution of something better. He spoke of the influence of improved means of communication in decentralising the residential areas of towns, which were now surrounded with imaginary lines representing the distances at which could reside the clerk, who had to go home to his dinner in the middle of the day; the business people who used restaurants; and the suburban residents. The slum dwellers, he considered, must be attracted away to something better at less or equal cost. To suddenly transport them to garden cities would be too radical a reform. These cities should be provided for an intermediate class —the respectable artisan, healthy, well fed, well clad, and earning a regular wage, but living in brick boxes with slate lids, rented at 5*s*. 6*d*. to 10*s*. a week. It was the vacated dwellings of this class, reduced in rent, which would be occupied by, and would form the first attraction to, the evicted dweller in the slum. For the very poor huge blocks of dwellings would be erected—not factories, but people's palaces, where three rooms could be obtained for from 3*s*. to 5*s*. a week. Those better off would live in small houses or double-floor tenements, which would be provided at 7*s*. to 10*s*. per week. He did not say that such houses would have gardens, as land would be too valuable for this; but every dwelling would be within walking distance of a park, would join a non-traffic street or an open court, which would be for the common use of the tenants of one terrace or one side of the street, which would be a playground for the children when out of school, and might occasionally contain the tennis courts or bowling greens for the adults. Of the many types of block dwellings, the Professor said the balcony type appealed to him most. He would make them five or six storeys high. In the case of the small houses he would have well-designed terraces.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute was held on Monday, the 7th inst., Mr. Leonard Stokes, President, being in the chair. A letter was read from Lord Carrington, Keeper of His Majesty's Privy Purse, stating that he had been commanded to announce that His Majesty the King was graciously pleased to continue to be patron of the Royal Institute and that he would continue to give the Royal Gold Medal. The following names were next read of Honorary Members who had been nominated for election: Right Hon. A. J. Balfour, M.P., Right Hon. John Burns, M.P., Right Hon. Lewis Harcourt, M.P., Field-Marshal Viscount Kitchener of Khartoum, the Right Hon. the Earl of Plymouth, and the Right Hon. Lord Redesdale of Redesdale. As Honorary Corresponding Member: Mr. Daniel H. Burnham (Chicago). As Honorary Associates: Mr. David G. Hogarth, Mr. J. S. Lucas, R.A., Professor W. M. Flinders Petrie, Mr. J. S. Sargent, R.A., Mr. Marion H. Spielmann, Mr. W. Hamo Thornycroft, R.A., and Mr. Laurence Weaver.

Mr. LEONARD STOKES then said it was his pleasant duty to refer to the recent Town Planning Conference. Everyone knew that it was largely in consequence of the support received from the Royal Academy and the Lord Mayor and Corporation of the City of London, and others, that the Conference proved such a success. Although formal letters of thanks had already been sent, he had no doubt that the meeting would like an opportunity by their applause of showing their appreciation of so much kindness. (Applause.) Then there were the services more particularly of their own branch to be considered. They had to thank the members of the executive committee, whose indefatigable chairman was Sir Aston Webb, R.A. An immense amount of work was done by them, and most especially by two of the members. The first was Mr. Raymond Unwin, on whose shoulders fell almost entirely the getting up of the Royal Academy Exhibition. When he did that work, Mr. Unwin was not a member of the Institute, and took all the trouble without being in any way connected with it. But that afternoon the Council had elected him a Fellow of the Institute in accordance with by-law 12, in recognition of his great services in the cause of town planning, and, secondly, to the Institute. The second name was Mr. John W. Simpson, the secretary-general of the Conference. (Applause.) It was doubtful whether the meeting really realised the amount of work Mr. Simpson had done. He was a born organiser. In order to offer Mr. Simpson something more tangible than applause, it had been decided to beg his acceptance of a Sheffield-plate inkstand, suitably inscribed, as some slight recognition of his labours.

Mr. J. W. SIMPSON, having been presented with the inkstand by the President, was received with prolonged applause. He was, he said, more grateful than he could tell for the kind things the President had said and for the endorsement of the meeting as shown by their applause. It was, he believed, the first time that the Institute had, as a whole, made such a presentation to one of its members, and he was therefore very proud that he should have been deemed worthy to receive it. But his pride was tempered by his recognition of the fact that he was merely a figure-head, and that he received their thanks as representing a band of workers over whom he had the honour to preside. That band was so large in number that the resources of the Institute would hardly be equal to presenting each member with an inkstand; therefore he acknowledged on their behalf the handsome and generous recognition of their services. It was a great pleasure to have an opportunity of saying publicly how much they owed to Mr. Leonard Stokes, as President, and to Sir Aston Webb, R.A., the Chairman of the Executive Committee, and especially for the full and unquestioning confidence they were good enough to place in him as secretary-general. He felt that whatever steps he took would have their support. Then there was Mr. Raymond Unwin, who seemed as if he could not make a mistake; Mr. H. V. Lanchester, who had done an enormous amount of preliminary work; Sir A. Brumwell Thomas, to whose patient care was due the credit of organising the visits; and Mr. H. Tanner, jun., and Mr. Dare Clapham, who acted as kind of brigadier-generals and who had achieved great renown as the men who knew their job. Lastly, it was impossible to leave the subject without a reference to the devoted and unselfish work of the staff of the Institute. He was afraid the staff had been abominably treated, and worked very hard. It was their good fortune to have achieved success, for the function happened to go off very well. He ventured to think that the Royal Institute had benefited by being brought into the public notice and by showing that the finest town planning had always been done by architects. In the name of his co-workers he thanked the meeting for their very generous kindness from the bottom of his heart.

Mr. LEONARD STOKES then delivered the following

Presidential Address.

Although I have for some time past been acting as your President, this is the first opportunity I have had—and I hasten to avail myself of it—to thank you all for the honour you have done me in electing me as your President. I need hardly say that I much appreciate the honour, though I could perhaps have wished for a somewhat less strenuous term of office, for although this is but the opening meeting of the Session, the Institute has already held a great Town Planning Conference. I know you will be glad to hear that this was an unqualified success, thanks to Royal patronage and largely to the great help received from the Royal Academy and the City Corporation. But, if I may say so, this Institute deserves some credit for having had the boldness to take the matter up and the ability to carry it through so successfully. I think, too, we have shown the world at large pretty thoroughly the substantial interest we take in the subject of Town Planning, and our capacity to deal with problems of this nature in a large and public-spirited manner.

Having had such a successful Conference, however, it would be folly to let the matter drop, and it is proposed to hold shortly a much smaller gathering, composed entirely of experts, with a view to seeing if some definite proposals on the subject cannot be drafted, for the help of those either actively engaged in carrying out works of this nature, or in preparing schemes under the Act. Some conclusions of this sort would be most helpful, and as we have taken the lead we must not fall behind and let the subject get possibly into wrong hands.

Mr. Burns, who did so much for us as Hon. President, in one of his invigorating speeches during the Conference advised architects to come down off their pedestals and mix with their fellow-creatures and their projects. What I think

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he probably meant, if I may say so, was that we architects should come out of our shells rather than off our pedestals; and this is undoubtedly sound advice, for do we not represent the art which of all others has done the most for mankind, both as regards providing things of great utility and objects of the greatest beauty? Has not history, too, been more clearly written in the architecture of past ages than in any other medium? If so, there is no particular reason—apart from our natural modesty—why we should hang down our heads when forced to admit that we are architects; we should rather glory in the fact, for have we not, for that very reason, much to be proud of, and but little to regret? Anyone who has travelled knows that the extraordinarily beautiful and impressive tombs and temples on the Upper Nile are not things to be ashamed of; and are they not works of architecture produced by men? And let anyone who wants to scoff at us go to Greece, and then tell us what he thinks of what he has seen there. The sculpture is certainly wonderful, but I assert, without much fear of contradiction, that it is architecture which stands out pre-eminently in this great home of art.

In our own country, too, is not the case very much the same? What is most calculated to raise the mind, cultivate the taste, and generally inspire us with a love for the beautiful in almost every village we go into? Is it not the parish church? And if we choose a town, and not a village, is it not again the cathedral which dominates the whole, asserting with solemn dignity that architecture has but few rivals and certainly no equal? I do not for one moment wish to imply that good architecture is only to be found in our churches and cathedrals. I only wish to make it clear that there, at any rate, we, in a most thrilling way, see proclaimed the greatness of our calling.

To take this great city alone, is it not architecture which makes it so interesting, though somewhat bewildering? And may I ask, without any disrespect to other arts, whether the intelligent stranger is most impressed by the works of the English painter, the English sculptor, or the English architect to be found within its walls? I daresay we might have had even more fine buildings had the national temperament been given rather more to display and less to money-making, but, at any rate, we have a unique collection in our City churches, with St. Paul's Cathedral at its head. Wren, too, made a plan for rebuilding London after the Fire, a plan which everyone now regrets was not carried out; and yet if the same opportunity were to come again to-morrow I daresay those in high places would make the same mistake their forefathers made, and in spite, too, of all they have recently heard on Town Planning. In fact, within the last few days the City Fathers have decided to build a new bridge across the Thames under the very shadow of St. Paul's, and yet, in preparing their scheme architectural effect in dignified arrangement is the one matter that is left to take care of itself; and not only that, but when a deputation from this Institute waited upon the Bridge House Estates Committee, which had the matter in hand, and besought them to take advice on this particular point, it was disregarded and misunderstood, and the world has been told that it would cost a million more to carry out the scheme proposed by the deputation. Now I wish to repeat what I have already said in the public Press, that all the deputation did was to urge upon the committee the importance of considering St. Paul's Cathedral when selecting the position of the bridge, and the arrangement of its approaches, and the necessity of obtaining the best possible advice on this point from the first. That was the scheme proposed by the deputation, and one would have thought that as business men they could have seen the wisdom of getting the very best possible advice before embarking on any project costing nearly two millions of money. There are many ways of doing most things, and probably more than one of laying out this bridge, and what we fear is that the Corporation has not yet hit upon the best way. I see in the Press that designs for the bridge are to be advertised for, but what should be done is to advertise for a scheme, rather than a bridge, if any advertising is necessary; but the right thing to do, I maintain, is for the Corporation to appoint the best architect it can find—for there are architects and architects, I fear, just as there are golfers and golfers—to work with the engineer and the surveyor they have already appointed, and for these gentlemen to reconsider the lay-out of the bridge and its approaches, and have proper models made, so that this magnificent opportunity of making a really great national improvement may not be thrown away. A glance at the plan approved by the Corporation will explain my meaning, for on this the position of St. Paul's Cathedral is not even indicated. If something of this sort is not done, then the only course I can see is for us to raise as much public interest and influence as we possibly can, and oppose the Bill in Parliament, when the Corporation seeks the necessary powers to erect the bridge. Your Council, has, however, decided to petition the Corporation in the following terms:—

To the Right Hon. the Lord Mayor, Aldermen, and Commons of the City of London in Common Council Assembled.

The Humble Petition of the President and Council of the Royal Institute of British Architects

Sheweth

That your Petitioners have had before them the Report of the Bridge House Estates Committee containing a scheme for the new road and bridge, in regard to which they understand that Parliamentary sanction is about to be applied for. Your petitioners venture to urge the advisability of obtaining architectural advice upon the whole proposal, which involves artistic considerations of great importance.

Your petitioners, with the support of the many distinguished persons whose names are attached to this petition, therefore humbly pray that you will give careful consideration to this aspect of so important a public undertaking.

And your petitioners will ever pray, &c.

Signed on behalf of the Council of the Royal Institute of British Architects,

LEONARD STOKES, *President.*
HENRY T. HARE, *Hon. Secretary.*
IAN MACALISTER, *Secretary.*

and I hope even yet we may be successful.

Of course, if it is decided to ignore architecture altogether in the bridge and adopt a design entirely of an engineering character, and another Benjamin Baker can be found, I can imagine a steel bridge of a single span which might look very fine, but even then the approaches must be properly arranged and designed by an architectural mind, as I take it that these cannot very well be of steel in any case.

While on the subject of bridges it may be interesting to inquire into the designing of some of our best examples, viz., Waterloo and London Bridges, and my friend, Mr. A. E. Richardson, has kindly supplied me with the following information, which he has collected for a book he is writing entitled "Monumental Architecture in Great Britain." Waterloo Bridge, which was at first called the Strand Bridge, was designed by Ralph Dodd, an engineer who had, however, made a particular study of architecture, and an Act of Parliament was obtained in 1809 for its erection on Dodd's design. Before the bridge was begun, however, Dodd was deposed and John Rennie, another engineer, who, however, does not appear to have had any particular knowledge of the subject—having begun life as a millwright—was employed to carry out the work, and the following extract from the *Gentleman's Magazine*, page 482, vol. 87, 1817, the year the bridge was finished, is, I think, conclusive:—

"Mr. Ralph Dodd requests us for the sake of justice to contradict an assertion which has got abroad, viz. that Mr. Rennie was the architect of the Strand or Waterloo Bridge, which he says 'is not the fact, it being an honour that I cannot allow to be taken from the family. The plan and design of that bridge were approved by the proprietors, and its measurements inserted in the Act of Parliament for building it (of course no other could be admitted) long before Mr. Rennie had anything to do with it. These plans are now accessible for the inspection of any gentleman who may wish to see if they have been acted upon, and in which it is presumed the architectural taste of this country has not been disgraced.'"

The cost of the bridge was 565,000*l.*, the approaches 112,000*l.*, land and buildings 373,000*l.*; total 1,050,000*l.*; and it took six years to build. We may, therefore, take it that the designer of the bridge was Ralph Dodd, an engineer who had made a special study of architecture, and was naturally and very justly proud of its architectural effect.

It is suggested that Dodd in designing Waterloo Bridge may have gone to old Blackfriars Bridge for his *motif*. This bridge was the work of Robert Mylne, and was designed by him on his return from Rome, where he had been studying architecture, and was somewhat similar in design to the present Waterloo Bridge, as may be seen from the old drawings of the bridge hanging on the walls.

We now turn to London Bridge, the design for which was undoubtedly produced by John Rennie—the work being carried out by his son, Sir John Rennie. Having been con-

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nected with the erection of a fine work like Waterloo Bridge, it seems only natural that Rennie should have made a good design for London Bridge, and we are grateful to him for having done so; but it is interesting to note that the younger Rennie was Professor Cockerell's brother-in-law, with whom I believe he travelled a good deal, and that Cockerell must in all human probability have had some influence on Rennie when he was designing the details of the bridge. We know, at any rate, that Professor Cockerell made designs for the buildings connected with the approaches to the bridge, and that these were considered by the committee, but rejected, and the work was eventually put in the hands of Sir Robert Smirke. Rennie regretted very bitterly the non-adoption of Cockerell's designs, and could never bring himself to admire those erected by his other friend Smirke.

I think I have now said enough to show pretty clearly that the designers of our best bridges, even if they were not architects by name, were so by training, at any rate, and good architecture, whatever may be said about it, cannot be produced except by a trained mind.

But I have wandered somewhat from my point, which is that architecture is an all-important matter. I, however, fancy some people may say, "That is all very true of the past, but architecture is not what it used to be." Well, I deny that. The best architecture in England of recent years is just as good on the whole as it ever was, though conditions are much more difficult and great opportunities not so often to be met with. If evidence is wanted to prove this statement look round the walls to-night, and you will see representative work of some of our Architect Royal Gold Medallists—as far as we have been able to collect and exhibit them—since the medal was first presented in 1848 to Professor Cockerell. The names of such great men as Cockerell, Barry, Donaldson, Tite, Owen Jones, Scott, Street, Butterfield and Bodley, not to mention living men, are enough alone to prove my case without looking at the work here shown—though I advise you nevertheless carefully to examine it; and also please remember that there is at least one other name equally great, which, for some reason or another—but I think not through any real fault of this Institute—does not appear in the list of recipients of this Royal recognition of our calling.

It may be said that these gentlemen are exceptions. Of course they are to some extent, but there are many others who approach very nearly to them in the quality of their work and in their power of design. And I think to-day we have even more good men than ever, particularly amongst the younger generation, their training now being so much more systematic than it used to be; and we hope to make it even more so in the future, as the various architectural schools about the country are all doing such good work. There is, however, a general feeling amongst thinking men, I fancy, that we do not take our students far enough along the road to proficiency. They are very well grounded in many cases, but their studies, under direction, are cut too short, and they are left to shift for themselves just when direction would be most useful and a helping hand of the greatest assistance. If I may say so, it seems to me that the Royal Academy is the right body to undertake this higher educational work, at any rate in London, and if it would establish a school somewhat on the model of the Ecole des Beaux-Arts in Paris, then I am sure we as a body would be most grateful. There are plenty of schools where the smaller architectural subjects are taught, but larger projects are not often dealt with, and the Academy might well take them up, and if Town Planning is to become a living thing amongst us the design and arrangement on dignified lines of streets, bridges, squares, and other open spaces must be systematically taught to our students.

A large sum of money has recently been left by the late Mr. Henry Jarvis to this Institute, to be spent either on new premises or on studentships and prizes, so that, fortunately, we are just now in a position to offer encouragement to this kind of study should we deem it desirable, as no doubt we shall.

As this is the first meeting held under what is now practically our own roof since our foundation in 1837, I think we may congratulate ourselves on the event, and our Hon. Secretary and Architect upon the success of his efforts in adapting these galleries to our use. Those of us who knew them as they used to be can hardly recognise this fine suite of rooms we are now in, which will give us the space to develop in that we have badly wanted for years past. Whilst on this subject I should like to give you a rough outline of our present position with regard to these premises. We are, then, as I have said, practically the freeholders of the whole of 9 Conduit Street, including these galleries, as we hold them on a perpetual lease from the Corporation of London, and we have not only turned a short lease of 9 Conduit Street into a perpetual one, and added something like 112 per cent. to our accommodation by acquiring and adapting these galleries, but have only added 88 per cent. to our old expenditure in so doing. We may be shoemakers' children, but in this case I think we have managed to get pretty well shod.

It is proposed to hold exhibitions, &c., from time to time in these galleries, and I think we shall find them of use in many ways; but if at times we have no particular need for them, there must be numbers of societies who would gladly rent them from us for exhibitions or meetings. There is a separate entrance from Maddox Street, and the letting-off of two of the galleries under the name of Maddox Street Galleries would be an easy matter, and it could be done without interfering in any way with the ordinary work of this Institute, and two or three hundred a year, say, might thus be added easily to our income.

I now want to remind you of another subject that has been actively engaging the attention of most of us for years, and which resulted last year in our acquiring another supplemental charter and new by-laws. Under these a new class of members has been established in this Institute, for it was felt that we should be the unmistakably representative body in the profession. These new members are called Licentiates, and we hope to enrol practically all *bona-fide* practising architects who are not already members in this class. You are aware that there are a large number of men about the country who, for one reason or another, never presented themselves for our examinations or became either Associates or Fellows. Many of them are now in active practice, and we can hardly now ask them to subject themselves to examination; the only thing that we ask of them is, therefore, that they shall be thirty years of age, have either been in practice for five years, or shall have been engaged in the study or practice of architecture for ten years. This class is to be a temporary one, open for twelve months only, and I am glad to say many hundreds have already joined, though only six months out of the twelve have yet elapsed. When once within our ranks Licentiates can either remain in that class or can pass on to the Fellowship, when qualified, and after passing such examinations as may be established. Such examinations may possibly largely take the form of an inquiry into the quality of the candidate's executed work, or may even take the form of the special examination for the Associateship, the Board of Education having power to exempt a candidate from such subjects as his executed works may show him to be proficient in.

I do not want to weary you with this subject, but I do think it most desirable that as many members as possible should join our ranks, for, firstly, I think we are well worth joining; and, secondly, when we have a large roll of members we shall be much more influential, and can then apply to Parliament for such form of recognition as we think most desirable I cannot say that I am a great believer in Acts of Parliament, but others, perhaps, are, and when we are a united profession we shall at any rate be in a better position to decide what it is we really do want, if anything, beyond being qualified members of the one society which is recognised by all as truly representing architecture in this country.

Whilst on the subject of Acts of Parliament I should like to call your attention to the new Copyright Bill which it is proposed to introduce this autumn, largely, I believe, to meet the wishes of painters and sculptors, who, I think, are reasonably dealt with in the Bill. Architects, however, come off very badly, for any little right we may now have in our designs is to be taken from us ruthlessly and vested in the building owner. If anyone copies a piece of sculpture the copy can, under the Bill, be destroyed by the original designer. But an architect having once designed a building has no further right in his design whatever. The building owner, however, can, apparently, repeat the design up and down the street, or he can sell it to the promoters of another estate to repeat *ad nauseam* all over the place, and the architect is powerless. This hardly sounds like common justice, but it may be. Again, if I design a chimneypiece and put it in the best bedroom of a house for A., I can never use that chimneypiece for B. without laying myself open to prosecution by A. This seems a little hard, as we all know there are numbers of small fittings, like door furniture, bell pushes, and grates, that, having once designed, an architect likes to feel he can use again and again if he so desires. The new Bill, however, will stop all this, unless we can get it altered, or

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hit upon some way of "contracting out" of it. At present we are only liable to be copied by those who have a sneaking admiration for us. In future, if the Bill becomes law, we shall not be allowed to put up even colourable imitations of our own work. This will come very hard on some of us, I fear!

You will be glad to hear—if you have not already heard—that the Lord Mayor, when asked to form a committee to organise a memorial for London to the memory of Edward VII., at once wrote to me as your President, and asked me to serve on that committee, and, feeling that you would like to be represented, I accepted the invitation on your behalf, and since then my name has been added to the executive committee. I feel, of course, the responsibility of the position, but will do my best to represent architecture in response to the compliment paid to this Institution. The problem of selecting a suitable form for the memorial is not an easy one to solve, but besides being architects we were all loyal and loving subjects of our late King, and I know you would all wish a suitable memorial to be erected in London to our late King and Patron's memory.

In conclusion I will only add that we architects are obviously somewhat powerless unless men who have the control of public and other works will come to us to help them. At present the fashion is all for buying old masters and preserving old buildings, very little encouragement being given to those who have to provide old masterpieces for future generations. Large Government and Municipal Departments do not sound like places where art is likely to thrive or flourish, and yet most of our principal public works now first see the light in these uncongenial hotbeds of sealing-wax and red-tape. And when our governing bodies do not encourage and appreciate the beautiful, how can we expect the public to understand that it is possible to transform even commonplace projects into works of real grace and beauty? Ornament and elaboration are quite unnecessary, but thought, study, and skill are indispensable. With these, however, the most ordinary and everyday undertakings have been in the past, and can again in the future be, transformed by proper architectural treatment into things of real beauty, a pleasure to see, a pleasure to live with, and a lasting benefit not only to us but also to our children and their children's children.

Sir GEORGE H. REID proposed the vote of thanks. He began with a humorous appeal to the sympathy of the audience for having promised at a dinner to make a speech, and for having to deliver it in cold blood rather than at a time when the critical element of human nature was vanquished. The Royal Institute were perhaps fortunate in having the grievance of the proposed bridge, for an Englishman was not worth anything who had not a grievance. For once in a way the grievance seemed to be a sound one. It was impossible to go through London without wondering how the city got built in the way it had. Though there certainly was not much trace of a plan, there were some grand things about it, but he did not know one that was less than a hundred years old. That things moved slowly in this country was exemplified in the fact that it was seventy-three years since the Institute first endeavoured to get a house of their own, and now that very evening they were glorying in getting it at last. In 1837 Australia was almost a virgin space, whereas now it is one of the most progressive countries under the sun. Out in Australia there were a number of great architects who had a grand inheritance in the genius of their predecessors. St. Paul's, Westminster Abbey, and the Houses of Parliament were themselves sufficient to make London a grand city. And why, he asked, should not the architects of to-day have an opportunity of designing great buildings like those? It was to be hoped that the projected Australian capital would have the benefit of a wise system of planning—in fact, of the very best plan in the world, whether it came from Australia, Great Britain, or Germany. There was one good thing about architects, viz. that their genius may lay fallow for a very long time and then reappear. For instance, in that room he understood there was a descendant of Inigo Jones. Referring to the usually enormous bill for extras presented at the conclusion of a contract, Sir George Reid proposed that whenever that bill was more than 75 per cent. of the contract amount the Institute should put the architect in a beginners' class. He also pleaded that architects should consider in their house planning men of a build similar to himself by substituting lifts for the wasteful grand staircases. Another suggestion was that garden planning should be made much more of a prominent feature in future architectural work. In conclusion, Sir George Reid expressed his conviction that, great as has been the past of the Royal Institute, their future will be still more so.

Lord PLYMOUTH said it was impossible for him to refuse to second the vote of thanks, difficult though the task might be at a moment's notice, since he had just been paid the great compliment of being included among the honorary Fellows. With regard to the Presidential Address he would like to say that, though many hard things might be said of architects in London and in the country, he honestly believed that the troubles arose mainly from the inability of those responsible for the financial part of building to appreciate what was best and finest in architecture. The public looked to those in that room, who rightly represented the competent architects of the country, for a lead and for the best instruction. One of the things that came prominently into his mind while he was First Commissioner of Works was how grand it would be for the public bodies in London if they could turn to some established and small committee of experts for guidance in their architectural difficulties. The Royal Institute would obviously be well represented on such a body. He thought that the public would greatly benefit by giving themselves a little more into the hands of those who have studied such problems all their lives, instead of going blindly into architectural work without being adequately equipped. His firm conviction was that the position of the Institute and the place it holds in this country was being strengthened year by year, and that it now truly represents the best knowledge in this great branch of art that exists in this country.

Mr. WALTER MILLARD asked, as one of the President's oldest friends, to be allowed to say a few words about Mr. Stokes himself. Thirty years ago he dropped into a class of the Architectural Association, although he was not a member. A little crowd of students were round a table, and among them was a fair flaxen-headed youth who was very freely giving his opinion about the other people's designs. On asking a man next to him for the name of the youth he was told that it was Leonard Stokes. A very few days elapsed before his name cropped up again; this time it was when he (the speaker) was in Street's office, and word was brought that Leonard Stokes wanted to see "the Governor." Some time after Stokes had been sent to Christ Church Cathedral, Dublin, Mr. Street said to him (the speaker), "Oh, by the way, next Monday Leonard Stokes is coming into the office. I think you will find he has a head on his shoulders." Very soon after he and Leonard Stokes were out of the office working together, travelling together, and living together for months at a time. Afterwards Stokes won the Pugin Studentship at an age which made many people wonder if he was as young as he looked, and later became President of the Architectural Association. In conclusion, he would only ask what they thought of Mr. Street as a prophet, in saying that "Leonard Stokes had a head on his shoulders"?

The PRESIDENT, after brief acknowledgment, announced that the next meeting would be a business meeting, on Monday, November 21, when the draft regulations for the conduct of competitions will be presented for consideration. In conclusion, he intimated that refreshments were served in the adjoining room. A large number of those present then proceeded to inspect the drawings hung on the walls of work by past Royal Gold Medallists.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

AT a general meeting, the first of the winter session, held in the Society's newly-acquired room at the Leeds Institute on Thursday, November 3, the President, Mr. Sidney D. Kitson, M.A., F.R.I.B.A., announced the results in the competitions for the various prizes offered by the Society.

The silver medal and President's prize for the best set of measured drawings had been awarded to Mr. J. H. Farrar (Leeds) for drawings of Holy Trinity Church, Boar Lane, Leeds, a consolation prize having been awarded to Mr. P. H. Audsley (Dewsbury) for drawings of Tickhill Church, Yorkshire.

The prizes for design had been won by Mr. F. L. Kruckenberg (Ilkley) (first), and Mr. W. Voelkel (Castleford) (second); the prize for sketching by Mr. E. H. Gibson (Harrogate), and that for construction by Mr. G. H. Foggitt (Yeadon).

In the sketching club competitions the prizes for the best set of sketches had been awarded to Mr. J. H. Farrar, and that for the best studies of ancient buildings to Mr. J. T. Pilling (Leeds).

In briefly commenting on the works entered, the President said that although the amount of competition was disappointing, much of the work had attained a high standard of quality.

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A short time was spent in examining and criticising the drawings, and a further exhibition of the prize works was held at the general meeting on Thursday, November 10, at the Queen's Hotel, Leeds, when the President read his address and the prizes were presented; the meeting was followed by the annual smoking concert.

ILLUSTRATIONS.

THE INFANTS' HOSPITAL, VINCENT SQUARE, S.W.

THIS hospital was built by Mr. ROBERT MOND to investigate and demonstrate the means by which prevalent disease and mortality among infants may be prevented. Messrs. PATMAN & FOTHERINGHAM were the general contractors, the sub-contractors being as follows:—Constructional steelwork, Messrs. R. MORELAND & SON; Durato floors in wards, Messrs. HOFLER & Co.; heating and ventilating, Messrs. KORTING BROS.; electric lighting, Messrs. CASH & Co.; carving, Mr. C. MABEY. The Lecture Room was panelled and decorated by M. DANIEL BARLET. The architects were Messrs. READ & MACDONALD.

PRUDENTIAL ASSURANCE COMPANY'S OFFICES AT BRIGHTON.

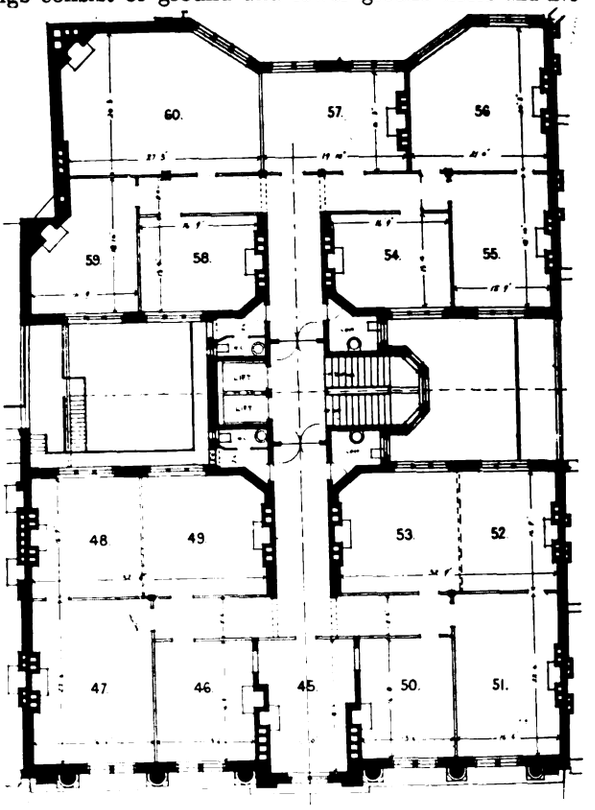
THE Brighton premises of the Prudential Assurance Company occupy a large site at the junction of North Street and King Street, the main frontage being towards the former street. The company's own office is a portion of the ground floor at the south-west angle of the site. In the centre of the south front is an entrance, with staircase and lift, leading to the upper floors, which are planned partly as residential flats and partly as offices. There is a large shop at the east end of the frontage, and the rest of the ground floor is let to a bank, an insurance office, and a firm of wholesale and retail ironmongers. There is a second entrance for the flats in King Street. The main elevations, which are Classic in character, are executed in red terra-cotta and red bricks, the former being supplied by the Burmantofts Works. The general contractors were Messrs. J. LONGDON & SONS, of Sheffield, the foundation contract having been let to Messrs. NORMAN & BURT. The interior faïence of the Prudential office was carried out by Mr. ALFRED WHITEHEAD, of Leeds. The clerk of works was Mr. THOMAS HAIGH, and the architect is Mr. PAUL WATERHOUSE, M.A., F.R.I.B.A.

MESSRS. NOVELLO'S NEW BUILDING.

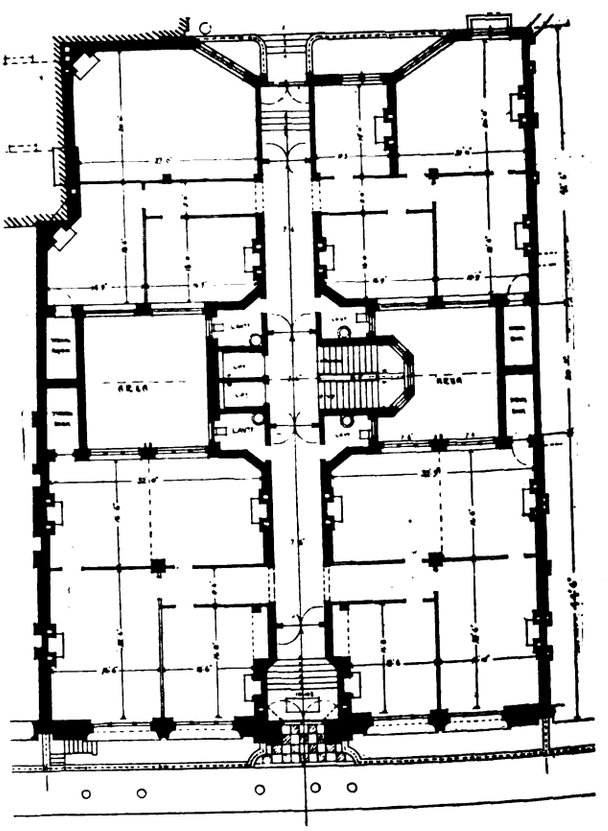
THE hall of Messrs. NOVELLO's new building in Wardour Street is 44 feet by 36 feet and 24 feet high, lighted on the Wardour Street side by five tall mullioned windows, and is panelled in oak, with Corinthian pilasters and cornice rising to a height of nearly 17 feet. On the side opposite to the windows is a gallery supported by columns and approached by two small staircases, one on each side. Under the gallery is the fireplace, with a chimney piece of Pavonazza marble, and an oak over-mantel most elaborately carved with festoons of flowers and Cupids' heads, after the manner of GRINLING GIBBONS. The doorways, one at each end of the hall, are enriched with columns and pediments, while the folding doors themselves have pierced and carved panels; and immediately over each is a panel containing representations of musical instruments festooned with flowers. At either end are two bookcases in oak surmounted by a carved cornice, and the room is lighted by two large silvered electroliers of twenty-four lights each. The architect was Mr. FRANK L. PEARSON, F.R.I.B.A.

FRIARS HOUSE, E.C.

THESE offices, erected by the owners, Messrs. HOLLAND & HANNEN, from the designs of Mr. ARTHUR BLOMFIELD, M.A., F.R.I.B.A., are in two blocks, one facing south to New Broad Street and the other north to Broad Street Avenue, a corridor running through from north to south, and having entrances at both ends. The New Broad Street front is in Portland stone, and the elevation to Broad Street Avenue in glazed bricks with Portland stone dressings. The floors, beams, and stancheons are in reinforced concrete on the Kahn system. The buildings consist of ground and lower ground floors and five



TYPICAL FLOOR PLAN.



GROUND FLOOR PLAN.



upper floors, and contain 104 rooms, not including clerks' lavatories, &c., which are on the basement and fourth and fifth floors, or caretaker's quarters, which are provided in the roof.

OXFORD COLLEGE SERIES, PEMBROKE.—OLD QUAD AND ENTRANCE —NEW QUAD.

WE this week complete our series of illustrations of Pembroke College with views of the Old Quad and Entrance and New Quad.

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INFANTS' HOSPITAL, VINCENT SQUARE, S.W.

Messrs. HERBERT READ & MACDONALD, Architects.

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MESSRS. NOVELLO'S PREMISES, WARDOUR STREET.

MR. FRANK L. PEARSON, F.R.I.B.A., Architect.

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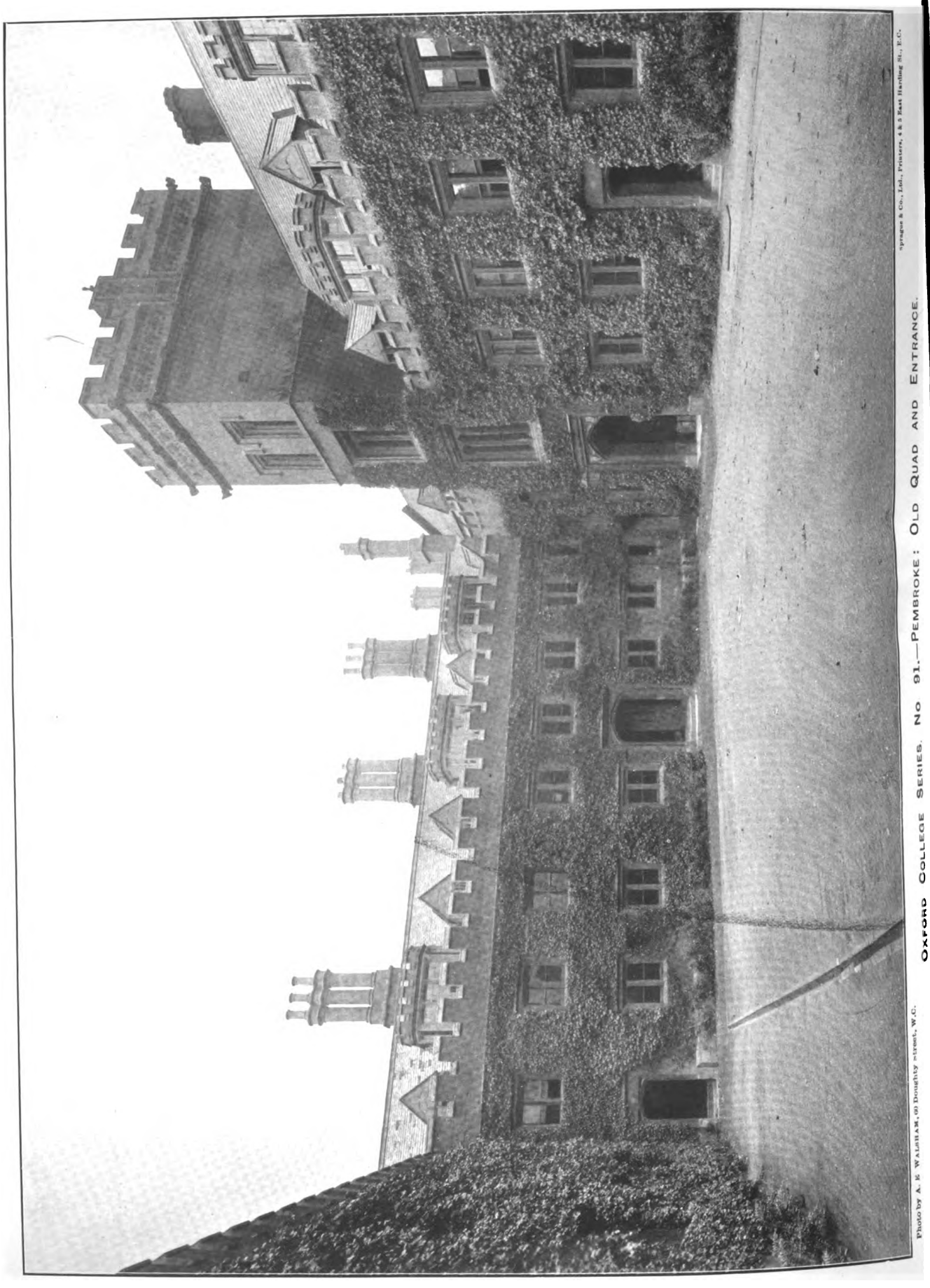


Photo by A. E. Walker, 60 Doughty street, W.C.

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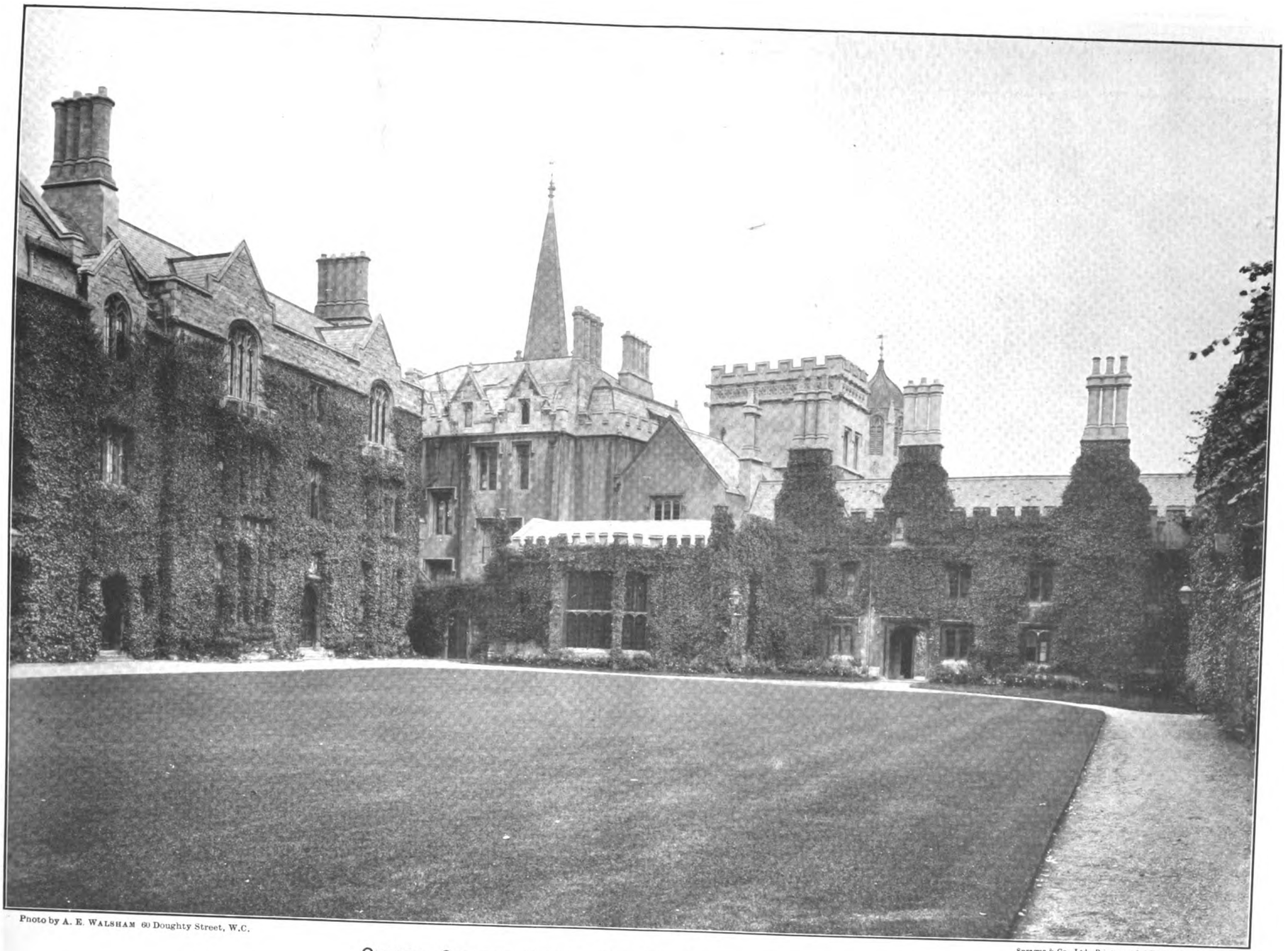


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PRUDENTIAL ASSURANCE BUILDINGS, BRIGHTON.

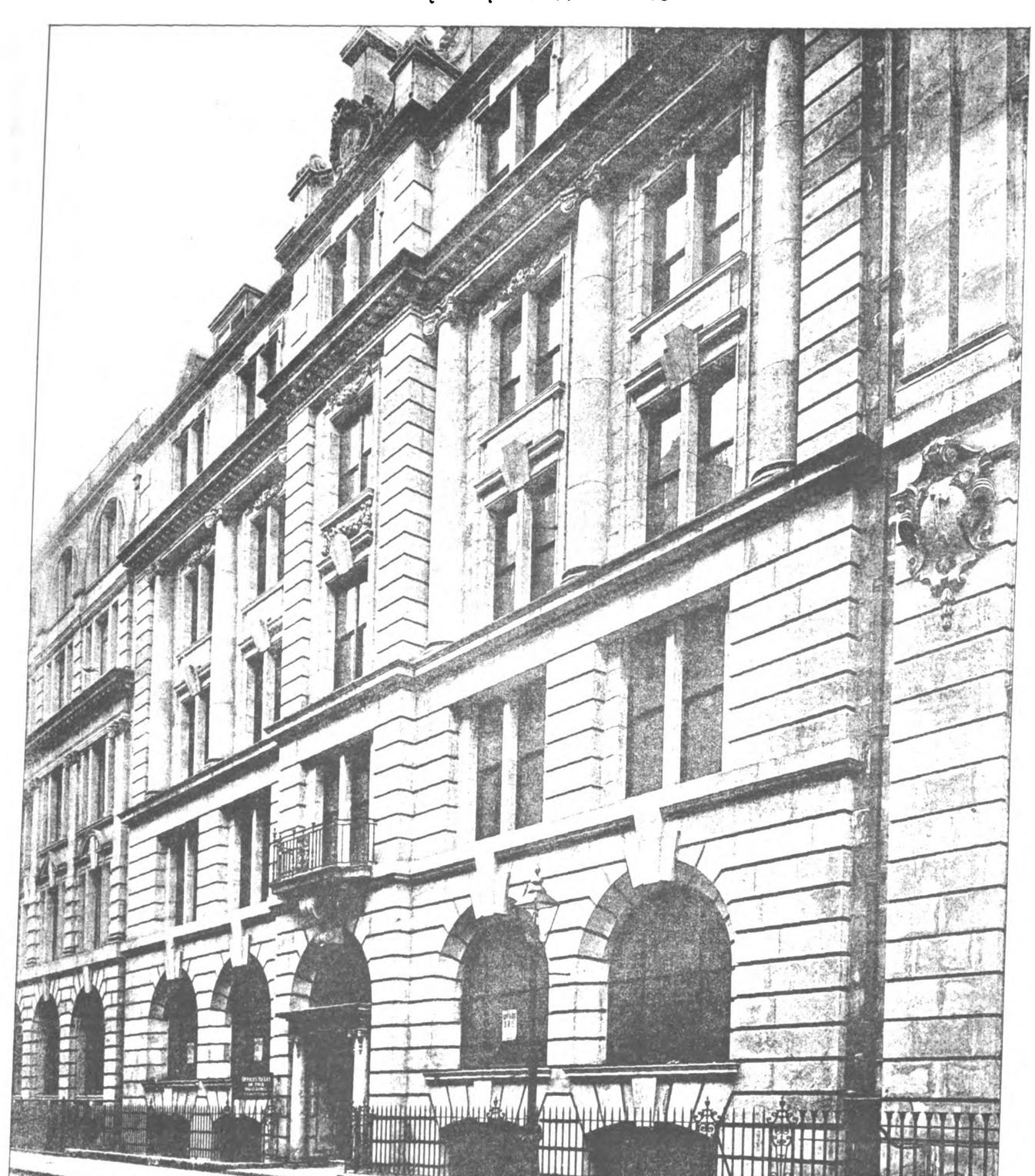
Mr. PAUL WATERHOUSE, M.A., F.R.I.B.A., Architect.

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FRIARS' HOUSE, NEW BROAD STREET, E.C.

Mr. ARTHUR C. BLOMFIELD, M.A., F.R.I.B.A., Architect.

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ARBITRATION PROCEDURE.*

IN considering the question of "Arbitration Procedure" we must necessarily assume a knowledge of arbitrations, what they are and how arrived at, as it would be quite impossible in the short time at my disposal to go fully into the broad questions of arbitration as a whole. The historical questions, the questions of the advisability of inserting arbitration clauses in agreements, and the many questions surrounding this important branch of the law must be left untouched, for to-night we are considering simply how an arbitration should be conducted; and this subject has been selected (although at all times interesting) as one which at the present moment and for the next few years is likely to be of practical utility. For instance, in valuing land under the Finance Act there will be numerous references or so-called consultations all over the country. Such consultations or references will doubtless be conducted as arbitrations, and gentlemen in your profession will be called upon to act as arbitrators or referees, or more often as expert advisers and valuers, and it is well that some uniformity of practice should be adopted instead of a series of happy-go-lucky methods, each peculiar to a particular district, and in some districts, I have no reason to doubt, extremely peculiar.

I must, however, make one preliminary explanation, so that we do not confuse valuations with arbitrations. To auctioneers and valuers this distinction will be as apparent as it is important. It is a subject one could say a good deal about; suffice it, however, for me on this occasion to point out the fact that I am not dealing with valuations. If you are called upon to arrive at a value of a certain property or timber or goods, either alone or in conjunction with another valuer, you are acting *quâ* valuer and not *quâ* arbitrator, the result of your labour is a valuation and not an award, and your responsibility in both cases is different, just as your employment is different.

Lord Esher said: "That if a man is, on account of his skill in such matters, appointed to make a valuation in such a manner that, in making it, he may, in accordance with the appointment, decide solely by the use of his eyes, his knowledge, and his skill, he is not acting judicially; he is using the skill of a valuer, not of a judge. In the same way, if two persons are appointed for a similar purpose they are not arbitrators, but only valuers"; and Lord Cockburn said further that that must not be taken to comprehend every case of compensation or value, as where, in ascertaining the value of property, or amount of compensation to be paid, the matter assumes the character of a judicial inquiry to be conducted by hearing the parties and the evidence of their witnesses, if it be the intention of the parties that their respective cases shall be heard and a decision arrived at upon the evidence which they have adduced before the arbitrator, it would be taking too narrow a view of the subject to say that because the object to be arrived at is the ascertaining of the value of the property, or the amount of compensation to be paid, the matter is not properly to be considered as one of arbitration. You may have a valuation between incoming and outgoing incumbents or tenants, or vendors and purchasers, but the person acting will be a valuer, not an arbitrator. In the case of a valuation the Courts cannot interfere or enforce the agreement as an award; an action for negligence would lie against the valuer, but not against the arbitrator.

With that preliminary explanation I will proceed with the subject of my lecture. We will assume that the submission to arbitration is complete—*i.e.*, that two persons have agreed to submit their differences, either existing or to arise in the future, to arbitration—and will consider the subject under the heads set out in the synopsis.

1. *The Appointment of an Arbitrator.*

The statute which regulates the procedure of arbitrators is the Arbitration Act of 1889, and a reference to the Schedule of that Act (see Clause (*a*) of first Schedule) will show that in cases when the submission is in writing, "If no other reference is provided, the reference shall be to a single arbitrator." It is very often assumed that a reference to arbitration in an agreement means a reference to two arbitrators and an umpire; but any such idea is altogether erroneous, and unless the agreement to submit specifies more, only one arbitrator is appointed. The agreement to arbitrate—in technical language called "the submission"—to be of real value should be in writing; and this agreement, as a rule, stipulates the number of arbitrators and mode of appointment. There may be (1) a sole arbitrator, or (2) two arbitrators and an umpire, or (3) two or more arbitrators.

One Arbitrator.

Here the arbitrator may be either—

1. Named in the submission.
2. Nominated by a person named in the submission either as an individual or as the holder of a particular office for the time being, such as a person nominated by the President for the time being of the Auctioneers' Institute of the United Kingdom.
3. Agreed upon by the parties to the submission.
4. In case of no agreement may be nominated by the Court on the application of either party.

Two Arbitrators and an Umpire.

As a rule, in this case each party appoints his own arbitrator, and the two arbitrators appoint an umpire. They owe a duty to the parties to nominate a proper person as umpire.

Two or more Arbitrators without an Umpire.

Instead of having two arbitrators and an umpire, it may be provided that there shall be two or more arbitrators; and in such a case it should also be carefully stipulated whether they are all to come to a unanimous decision or whether the majority can make an award. To have several arbitrators is not so usual as the other methods, though it has its advantages and disadvantages; unless the majority are empowered to make an award it must be signed by all the arbitrators, and in one case, where an agreement to refer disputes to arbitration, provided for a reference to "the decision of one arbitrator or of three arbitrators as mutually agreed," and that if three arbitrators were appointed one should be nominated by each of the parties and the third by the two so nominated, three arbitrators having entered upon the reference, two of them made an award from which the third dissented, it was decided that the award was invalid.

Of these methods the most advantageous, to my mind, is to have a single arbitrator, for it really does seem unnecessary to go to the expense of having three persons to try the dispute, especially as the result in most cases is that two arbitrators agree to disagree, and then the umpire decides the question alone in the end.

But when the parties have decided upon arbitration they seem to prefer to appoint their own arbitrator and to have an umpire, instead of agreeing upon a certain individual as sole arbitrator. The principle of having three is also objectionable because there is always a tendency, which is quite wrong, on the part of the arbitrator to look upon himself as an advocate for the side appointing him, rather than as a person acting in a judicial position, who should come to a decision on the facts presented before him impartially.

In the case of two arbitrators, Section 6 of the Act provides for any difficulties which may arise in consequence of either party refusing to appoint. When a submission provides that the reference shall be to two arbitrators, one to be appointed by each party, then, unless the submission expresses a contrary intention—

(*a*) If either of the appointed arbitrators refuses to act, or is incapable of acting, or dies, the party who appointed him may appoint a new arbitrator in his place.

(*b*) If on such a reference one party fails to appoint an arbitrator originally or by way of substitution as aforesaid for seven clear days after the other party, having appointed his arbitrator, has served the party making default with notice to make the appointment, the party who has appointed an arbitrator may appoint that arbitrator to act as sole arbitrator in the reference, and his award shall be binding on both parties as if he had been appointed by consent.

Provided that the Court or a judge may set aside any appointment made in pursuance of this section.

There is no provision for the case of a reference to three arbitrators.

Having arrived at the stage when the two arbitrators have been appointed, the next stage is the selection of an umpire.

I have already pointed out that the submission may provide for an umpire or a third arbitrator, and the difference. We are now considering two arbitrators and an umpire. When the two arbitrators have been appointed, then they appoint the umpire. (See Sect. 2 Clause (*b*) of Sect. 1.) If they fail, see Section 5 of the Act. The umpire must be appointed by the arbitrators in a proper manner; the appointment is a judicial act, and is not to be determined by chance—for instance, casting lots as to who shall select will not do, although in one case, where both arbitrators

* A lecture delivered by Mr. George Philips, J.P., of the Inner Temple, barrister-at-law, before a meeting of the Auctioneers' Institute at Russell Square, London, on November 9, Sir Robert Buckell, J.P., president, in the chair.

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chose an umpire, and they could not between them decide which of the chosen ones should be nominated, and agreed to determine that question by lot, it was decided that as by such conduct each arbitrator admitted the fitness of the umpire proposed by the other, the method of selection did not invalidate the award. If the arbitrators fail to appoint the Court will do so.

Qualifications of an Arbitrator or Umpire.

Anyone can be nominated and agreed to by the parties, and if the arbitrator appointed turns out to be unfit or incapable the parties have only themselves to thank. Arbitration is a method of settling disputes whereby the parties can secure their own judge and select a person who has expert knowledge of the particular matter in dispute, and thereby the parties consider they will have a judge who will be able to do justice between them equitably; and they may also imagine that it is possibly cheaper than going to law, though after considerable experience I am not always so sure about that. On the other hand, in many cases it is advantageous.

Nevertheless, an arbitrator or umpire holds a quasi-judicial position, and it would be a good ground to object to his appointment if he could be shown not to be impartial, or where he has a bias in favour of one of the parties, or a bad feeling or some concealed interest in the subject-matter of the dispute or in the success of the parties.

In choosing an arbitrator, of course, many things must be taken into consideration: there may be intricate accounts to be gone into, or difficult questions of engineering or surveying, and in such matters, when either party has any option in the choice of the tribunal to which the matter is to be sent for trial, he will, as a rule, be wise to exercise such option in favour of the appointment of an expert, as in getting up the evidence and presenting the case in a satisfactory, intelligible form the saving will be immense, because the professional arbitrator is able to act as his own expert to some extent, at any rate, in all technical questions arising, and thus save the parties a good deal of expense and avoid a protracted trial. These remarks apply only to a case where the disputes between the parties resolve themselves into questions of numerous technical details. Where the sole question is one of law it may very well be that a decision by an experienced lawyer will be preferable, as a trial in court upon a special case stated in the award, with all its delay and expense, may thereby be avoided. It must always be remembered that the qualification of an arbitrator is a very important matter, as he is to be the final judge. The submission is irrevocable without the consent of the Court, or agreement of the parties, or death, and thus in referring matters to an arbitrator this important fact must be borne in mind, because if either party wishes to revoke it will be necessary to make an application to the Court, either by motion or originating summons, and will not be granted *ex parte*. The application must, of course, be made before the award has been executed, and the grounds for revocation may be shortly enumerated:—

1. Bankruptcy of one of the parties (probably).
2. Corruption of the arbitrator.
3. Irregularity in appointment of umpire or in receiving evidence.
4. Arbitrator exceeding his jurisdiction.
5. Where arbitrator is going wrong on point of law, although in such a case the better method in ordinary cases is to apply for a case to be stated.

Getting up Case.

After the submission is settled and the arbitrator has consented to act, the important thing to be done is to ascertain exactly what the case is, and it will be necessary for both parties to get together the facts and evidence which they wish to bring before the arbitrator. It may be that one of the parties has a claim against the other; it may be that both parties have claims against one another. The question will arise whether the parties are going to engage legal advisers and solicitors; but these are matters which it is impossible to advise as to what is the best thing to do. Cases vary in difficulty, in the amount at stake, and the importance of the questions to be decided, so that what will be done in any particular case on these points cannot be considered with any usefulness; but whether they employ legal aid or do not do so the procedure, nevertheless, should follow upon the same lines, although, of course, if the agency of lawyers is going to be invoked the detail of procedure need not necessarily be known to the lay mind with so much detail, for in that case the legal advisers will see to these points. Nevertheless, there are many cases where legal aid will not be called in, and where it will be useful for arbitrators who are not lawyers to appreciate the proper method of arbitration procedure, and so it seems well to outline briefly the kind of steps that should be taken. Therefore, I trust these notes may be a guidance and assistance as well to a lay arbitrator (a position I have no doubt many of you occupy during the course of your professional experience) as to an expert witness or adviser.

I have said that the parties should get their facts and evidence together; having done this the claimant should formulate his claim in writing. For this purpose the facts must be known; correspondence, agreements, documents, accounts, plans, &c., relative to the dispute should be collected, put in order, and considered carefully, and then the claim made out in writing, this claim being, in fact, the question or questions the arbitrator has to dispose of; for it is extremely important that the arbitrator should know exactly what questions he has to decide, and a formality of this kind will enable the arbitrator the more easily to frame his award in a manner which will make it binding between the parties and to make a final settlement of the dispute. An omission to take this precaution may make the whole arbitration abortive.

When this statement has been thoroughly considered and put into proper form and completed a copy of it should be forwarded to the other side as the claim which it is proposed to put forward for the decision of the arbitration, with a written request to be furnished with a statement by the other side within a specified time, say ten days, as to his grounds of defence, and inquiring whether he has any questions or claims to submit by way of set-off or counterclaim, and if he has, to deliver them in writing within the time specified. When these written statements of the cases of both parties have been exchanged between the parties, further particulars of some of the items in the claim and defence and counterclaim and discovery of documents may be necessary and should be applied for in writing. It is quite possible that certain facts can be agreed, in which case a notice to admit facts can be delivered; and a meeting between the expert witnesses to agree quantities (which, you will understand) may also be a means of saving an enormous amount of further evidence and consequent expense of a prolonged sitting; or a view may be necessary by the witnesses of one side. If any or either of these things is desirable, they should be gone into, otherwise they may cause delay by lengthy correspondence between the parties, or a protracted trial, and very often the best plan is for the party requiring the information or suggesting the consultation to get the arbitrator to name a time for a preliminary appointment, at which application will be made for such particulars, &c., as may be deemed necessary. As part of this notice there should be added a request for a statement as to what particulars, &c., if any, the party to whom the notice is directed requires, so that both sides may be in a position to deal with all questions at the preliminary appointment without unnecessary adjournments. This appointment being taken is likely to considerably expedite and shorten the hearing, as each side will know fairly definitely what the other side's case is, and will be in a position to prepare his case accordingly, and thus avoid going into a lot of irrelevant matter. Claims and defence particulars, quantities, correspondence, and documents handed to him by his client, and the copies which will have been obtained from the other side, the solicitor, if one is employed, is in a position to prepare for the hearing before the arbitrator. The next question for consideration is whether the parties are going to conduct the cases before the arbitrator themselves, or instruct their solicitors to do so, or employ counsel. If counsel are going to be briefed, then the papers will be laid before him to advise on evidence; and it is important that this should be done carefully, so as to enable him to fully appreciate the direction which his opening speech and his examination of the witnesses should take. If this is not done and the disputes intelligently and thoroughly explained, it is not giving him a fair chance to effectively cross-examine a skilled witness on details of technical matters, nor to properly prepare the arbitrator's mind to take his client's view of the position when he himself does not thoroughly understand the case; and, of course, it is important so that he can advise what line it will be wisest to take, and whether any and, if so, what part of the case set forth in the particulars and supported in the proofs should not be gone into. Even if the parties do not adopt the method before detailed of preparing for the hearing, in my opinion an arbitrator, after studying carefully the terms of the submission, should request both parties to formally furnish him with a written statement of what they allege

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are the matters in dispute and which they require him to decide by his award. Otherwise, if this is not done, difficulties may afterwards arise, and the unsuccessful party—*i.e.* the party against whom the award is made—may endeavour to get the award set aside on some such ground as that the arbitrator has failed to decide certain questions, or has decided questions which were not submitted to him; whereas if the questions are put down in black and white such points cannot be so successfully raised; but more on this point when we come to consider the form of the award. Where technical matters have to be gone into the arbitrator will have to be enlightened upon all such points. As a rule, one competent expert on each side should be sufficient, and the parties on each side cannot do better than agree, with a view to limiting expense, each to confine himself to one expert, or two at the outside. In choosing this expert regard should be had to his special knowledge of the particular question in dispute, to his experience in such matters, and especially to his experience in acting as an expert witness and being able to stand the ordeal of cross-examination. Section 7 of the Arbitration Act gives the arbitrators or umpire (in the absence of provisions to the contrary) power:—

(*a*) To administer oaths to the witnesses (as to this see (*d*) in the first Schedule to the Act).

(*b*) To state his award in the form of a special case for the opinion of the Court (not limited, it will be observed, to a point of law).

(*c*) To correct clerical mistakes or errors in an award. Section 8 empowers parties to arbitrations to issue subpœnas (these in arbitrations are issued in the Crown Office).

Section 9 gives the Court power to enlarge the time for making an award, which by provision (*c*) of the first Schedule to the Act, in default of a time being fixed by the submission, must be made within three months after entering upon the reference.

The arbitrator will be furnished with copies of the claims and particulars, and will, in consultation with the parties, appoint a time for the hearing. The arbitrator may also have an adviser to sit with him and advise; for instance, a lay arbitrator in an arbitration where legal questions are likely to arise may choose a legal adviser to sit with him and *advise* him on legal questions; but such adviser must not act as though he were an arbitrator, because in so doing the tribunal the parties had chosen to settle their dispute would not be the tribunal deciding the question; and so if a lawyer was appointed arbitrator where engineering knowledge was required he could have an engineer to sit with him and advise in the same manner. You must note the word "advise." It is, however, wise to arrange with the parties before that such advice is being obtained, and ask for their consent to such an arrangement, because an arbitrator must not delegate his powers to another without the consent of the parties.

An important matter for consideration before even the preliminary meeting is whether either party objects to the jurisdiction of the arbitrator, because if this is to be done it must be at an early stage of the proceedings; otherwise it may be held that by going on with the arbitration without raising the point at the earliest moment the party wishing to object has waived his objection by his conduct; however, having once definitely placed on record his objection, he can go on under protest, and then the question of jurisdiction can be raised, if he so desire, at a later date.

Again, the parties may consider that there is an important question of law involved, and although the arbitrator may be a satisfactory judge to decide all questions of fact, yet that it is preferable that such question or questions of law should be decided by the Court. There are two ways of raising such a point. The arbitrator may be requested either to state his award in the form of a special case under Section 7, or he may state a case for the opinion of the Court under Section 19, and, in that event, adjourn the further hearing until the Court has decided the question so raised. It is a very important question to decide which course should be pursued. An award in the form of a special case will be decided either by a Chancery Judge or the Divisional Court; it can be taken then to the Court of Appeal, and may ultimately find its way to the House of Lords; whereas a special case stated under Section 19 is decided once and for all by the Court of First Instance, and there is no appeal from that decision. Which is preferable is a question to be decided in each particular case, and the point could only be discussed here from an academical point of view. While it would seem more expeditious to have a case stated under Section 19 for the opinion of the Court, yet one can never tell how many points of law may arise; and to be indefinitely going to the Court as each question arose would be an endless expense and take an endless time, whereas the stating of the award in the form of a special case would allow any number of questions to be raised and all being decided by the Court at one and the same time. There is, however, in the case of an award in the form of a special case the advantage or disadvantage, whichever it may be considered, of being open to further appeals, as before stated. The only way to come to a decision is to consult one's advisers in each particular instance, and decide each case according to what seems best under the circumstances of that case and according to the wish of the particular client, who in such a case, if wise, will undoubtedly have his legal advisers.

(*To be concluded.*)

ENGLISH DOMESTIC WORK.

THE second of the course of eight lectures by Mr. J. A. Gotch, F.R.I.B.A., F.S.A., at the University College, Gower Street, W.C., on the above subject dealt with

The Later Mediæval House.

The development of the English house, which sprang from very small beginnings, which had been treated in the first lecture, was rapidly skimmed. It commenced with very few rooms; the bedrooms, if any, were mostly recesses in the wall of the keep; the solar was the chief private room, while the hall was the principal room. So dominant was this latter apartment that the big house of a village became known as "The Hall." But there was always a striving after comfort, one of the first means to which was a subdivision of the space so as to provide separate rooms for separate purposes. This increase of accommodation was attained by the spreading out of each end of the hall; the solar at one end became a suite of family rooms, and the kitchen developed into a servants' wing.

That there was a real desire for increased comfort is shown by the records in the Liberate Rolls of the alterations and repairs carried out in the Royal residences of Henry III. between 1230 and 1270. It is highly probable that everyone, according to his means, would equally endeavour with the king to improve the standard of comfort. Besides the repairs—which were so frequent as to throw suspicion on the quality of contemporary workmanship—there were other works to provide additional accommodation, better protection against the weather, more light, greater warmth, improved sanitation, and handsome decoration.

In 1255 a staircase was ordered to be built at Rochester Castle, so that the chapel might be reached without traversing the king's chamber. At Havering in 1250 the pantry and butlery were enlarged, and a new salsary, larder and chandlery were built, as well as a chimney in the King's great wardrobe. At the same time the windows were deepened and the windows towards the sun were blocked. This subdivision of rooms should here be noted. The gardens, such as they were, also received attention. Large rooms were not infrequently added to increase the comfort of the house, as at Guildford, where a chamber 50 feet long by 26 feet wide was built for King Edward's son, with a chamber underneath for the noble valets. In other places chambers were added for the chaplains, the seneschals, and the king's knights. That is to say, the household, instead of being herded together, began to be accommodated in separate quarters according to their degree. It must not be supposed, however, that the standard of comfort was very high.

The need for better protection against the weather was met, among other ways, by the erection of porches, and of these there is frequent mention. In addition there were alleys, pent-houses, and aisles built in order to connect various rooms. These structural alterations were supplemented by the glazing of many of the windows, which hitherto had merely been closed with wooden shutters, hung on hooks. In 1238 Henry II. ordered that a window of one of the rooms at Westminster should be glazed so that that chamber might not be so windy. At Northampton a glass window, which might be closed or opened, was made in the hall opposite the king's dais and painted with the figures of Lazarus and Dives. In 1232 windows were ordered to be made in the king's painted chamber at Winchester expressly on the ground that it was too dark. In 1251 the windows of the chapel at Bristol were lengthened so that it might be better lighted.

There are many references to the providing of new chimneys, not only in the queen's chambers, but those for the

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knights and other male attendants. One of these was to be in plaster. It is seldom, in fact, that a new chamber was built without an express order for a chimney. There are also several orders for louvres. An interesting sanitary improvement was made at Westminster in 1260. A certain conduit was made, says the entry, through which the refuse of the kitchens at Westminster flows into the Thames; which conduit the king ordered to be made on account of the stink of the dirty water which was carried through his halls, which was wont to affect the health of the people frequenting the same halls. Earlier in the same entry reference is made to the conduit of water carried underground to the king's lavatory.

The king's orders were by no means confined to structural alterations; many of them include matters of decoration. It is curious to find how largely whitewash was used, and how it was applied to buildings in a manner to shock the æsthetic susceptibilities of the present day. The king's favourite method of internal decoration, however, was to paint the walls (and sometimes the ceiling) green, spotted, or scintillated, with gold. Orders were given once or twice to paint pillars of a marble colour. Such figure subjects were frequently painted on the walls or on the chimney as the history of a saint or a town, the wheel of fortune, the four Evangelists, or Dives and Lazarus. The wooden shutters of the windows were frequently decorated with the king's arms. It is obvious that there was a pronounced desire to render houses comfortable so far as warmth, light, and agreeable decoration could make them so. But though these efforts may have succeeded according to the standard of the times, they still fell far short of what would be required in the present day.

Consideration of the fourteenth century was begun by looking at a house which is of great size and much more developed than anything that preceded it. Mr. Gotch considered Haddon Hall as perhaps the most romantic and fascinating, as it certainly is the most instructive, example left to us of a large mediæval home. Haddon Hall consisted of two courts separated by a block of buildings which included the hall, kitchen, and accessories. The hall was cut off from the kitchen and buttery by a screen, with its gallery and passage. The bedrooms were placed round the courts. The weakest spot of the walls was at the corner occupied by the chapel. Penshurst, with its screen, open roof, and central hearth gives an admirable idea of a hall built about 1370. Reference was then made to Apethorpe (1500); Canons Ashby (1551-1584), whose tower may be reminiscent of the Border peels familiar to its Cumberland owners, and Warkworth with its ingeniously planned keep. South Wingfield (about 1440) has two courts also, but the hall is in an outside wing and owed its chief protection to the sharp fall of the ground on that side. The pointed doorway leading from the hall-porch to the garden was like the door of a church, and showed the close connection between domestic and ecclesiastical architecture. Of Tattershall Castle only the fine brickwork tower remains; this was probably the living portion. The interior must have been extremely gloomy, for though the windows were higher than in preceding buildings, they were set in such thick walls that the rooms must have been extremely dark. Neville Holt is a fine piece of Perpendicular design, particularly the church-like porch. The fine bay window at the dais end, which was introduced here and in many other places, probably originated in the desire to afford an outlook to the occupants of the dais by bringing the ordinary window to a lower level. The arms over the doorway at Stoke Abany (about 1470) are a foretaste of the heraldic displays which were to prove such a feature of Elizabethan times. Stanton Harcourt still retains its original doorway and door, the latter being hung on hooks to the stone jambs instead of being inserted in a door-frame. The beautiful Montacute Priory marks a distinct effort at picturesqueness of grouping and ornament. At Willington is one of the many examples left of the dove houses, which proved an important source of food, and possibly of profit, to the lords. At Lyddington was a palace of the Bishops of Lincoln, which later became an almshouse, though at the present time it is practically uninhabited. Its panelled ceiling was a forerunner of subsequent elaborate plaster ceilings.

THE plans prepared by Mr. F. W. Ruck, the county architect, for the proposed county offices at Maidstone have been approved by the Kent County Council's special committee. They will be submitted to the Council at its quarterly meeting on November 16.

SOCIETY OF ARCHITECTS AND THE LETTERS M.S.A.

IN the Chancery Division on Thursday, November 3, before Mr. Justice Eve, Mr. Neville moved for judgment in the action brought by the Society of Architects against Mr. C. E. Kendrick in respect of the use by him of the initials M.S.A. after his name.

Mr. Neville said that the plaintiff society sought an injunction to restrain the defendant, who was a builder, from using the letters M.S.A. after his name, or from using any other letters which would lead to the belief that he was a member of the Society of Architects. The case came before Mr. Justice Joyce, when there was no defence, and his Lordship said that the case was too trivial for the Courts to deal with. He therefore made no order. There had been a slip in the procedure at the time the statement of claim was filed. Ten days must elapse before default, and the ten days had not expired. The plaintiffs thereupon applied for leave to serve notice of motion, and that was granted by Mr. Justice Joyce. Upon that he now appeared before his Lordship. The matter was one of the utmost importance to the Society, and was covered by authority. If his Lordship would deal with it the case might go on; but if, on the other hand, his Lordship felt that he was bound by what Mr. Justice Joyce had said, then he was in a difficulty.

Mr. Justice Eve: There was no adjudication; but in a matter not properly before his Lordship Mr. Justice Joyce had expressed an opinion contrary to the plaintiff.

Mr. Neville said Mr. Justice Joyce had said it was unfortunate that the defendant did not appear, and it would be a serious matter to grant an injunction under the circumstances. In his opinion this was one of those cases in which the matter was too trivial for the granting of an injunction.

Mr. Justice Eve said it would not be respectful to Mr. Justice Joyce for him to go into the case, and he would not prejudice it by offering any opinion. He thought counsel had better go back to Mr. Justice Joyce to see what could be done.

THE NOTTINGHAM ARCHITECTURAL SOCIETY.

THE Nottingham Architectural Society opened their winter session on October 31, when Mr. R. Evans, jun., F.R.I.B.A., delivered the following Presidential address:—

When I glanced through the reports of the annual meetings of other societies I was appalled at the length and intricacy of the Presidents' addresses, but I was slightly comforted when my mind went back to our own meetings and I could not remember any very long addresses. I do not intend to weary you with much verbosity, but there are several matters which I should like to touch upon.

I think the first thing that occurs to one in framing any thoughts for a meeting of this kind is—What are the objects of our Society? In our rules, which we have just revised, and copies of which are now being circulated, they are stated as follows:—

1. Promotion of union and professional integrity amongst its several classes of members.
2. Uniformity of practice.
3. General advancement of architecture and allied arts.

The first two items are very closely connected, and are of the very greatest importance. It is most essential that we should obtain and keep the confidence of our clients, and to do this we must have uniformity of practice, which is based upon professional integrity and will safeguard us in times of dispute.

To uphold the dignity of the profession and to keep it as a profession our system of professional charges should be above suspicion. It is most necessary that an architect should inspire his client with the idea that he is doing his best for him and protecting his interests; at the same time we ought to hold the balance fairly in the interest of the contractor.

Day accounts are a matter in which we ought to be uniform in practice. It would strengthen our hands on this point immensely if we insisted on weekly returns, and either passed or rejected them immediately.

To return to the question of professional charges. There are customs in the profession which in a court of law might lead to a considerable amount of trouble unless it could be established that a definite custom was exercised in the profession. Take, for instance, the question of quantities and measuring-off fees for extras. As you know it is recommended by the R.I.B.A. that payment should be made by the client, but in many cases it is not so. It is absolutely essential that

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quantities should be got out, and it is quite fair that the client should pay for them. The general custom is for the fees to be included in the estimate and paid by the builder on receipt of the first certificate, but this should be done with the knowledge of the client. Only a short time ago there was a local case where the fees for quantities were disputed (a duplicated case)—fees which if declared beforehand would have been acknowledged, or at any rate a compromise arrived at.

At the last meeting of the Council a letter was received from a prominent member of the Society as to a scale of charges for works of a small and intricate nature, involving quite as much trouble as works of a larger scale. Referring to the minutes of the Council and the general meetings, there does not appear to be any reference to this, but I hope with the support of this member to bring it before the Society again and publish an agreed scale at the end of the annual report on the same lines as the scale for quantities.

I now wish to touch on a point where, I am afraid, I shall not find all my brother architects in agreement. I have been approached several times recently by contractors as to a point of practice.

These contractors object strongly to being asked by architects to forward to them cheques for payments for provisional amounts. I entirely agree with these contractors, and go further, and say that it is most essential for the maintenance of the integrity of the profession that no money should pass through the hands of any architect. It may be quite honest, and naturally should be, but there is the possibility of the architect being placed in a questionable position. Uniformity of practice is what we ought to aim for in every branch of the profession. Many of us are Freemasons, and, harking back to the days of the Renaissance, we find in Italy that there was a real genuine brotherhood between craftsmen.

In these days, owing, I suppose, to severe competition, we have allowed petty jealousies to step in and stifle to a great extent good fellowship and generous-minded admiration of others; but I think we can fairly say that at the present time we as a Society have advanced considerably towards a more united action on all points, and, thanks to the energies of several members, have tried to help the younger members of the profession by visits to various works in progress, and by instituting and supporting a Designing Club and arranging meetings for the criticism of the drawings. I think there is no doubt that the acquisition of our new room ought to increase the social and friendly meeting of members, and I am going to ask for a vote of members present for the sanction of a gas fire, so that when any members come in they can be comfortable at any time. I might also add that the caretaker will be glad to provide tea. I appeal to all members who are so disposed to lend or give books to the library, which ought to be of great use to associates.

Competitions.—I think we can congratulate ourselves that competitions are now managed more satisfactorily than formerly, but it has been brought to my notice that in the present state of business it is not fair to limit a competition to a few competitors. Personally, I think it is better to pay the few a small fee than to throw a competition open and waste an enormous amount of work, but I should be glad to have a discussion on the point. Now that all competitions are arranged in accordance with the conditions sanctioned by the R.I.B.A., with a competent assessor we can feel satisfied that an unbiassed opinion will be given, and the decision accepted in the same spirit that a cricketer accepts the umpire's verdict and walks to the pavilion with a smile on his face—if possible.

Licentiates.—A special committee of the R.I.B.A. has been formed to deal with this matter, and a postcard has been sent to every practising architect in the London Directory and the Home Counties, inviting them to a meeting on November 22, when the scheme for the admission of licentiates will be explained.

Town Planning Bill and Conference.—I was exceedingly sorry not to be able to attend the Conference, but was glad to inspect the exhibition of plans in Burlington House with Mr. Bromley.

A very amazing exhibition it was, and one which would have taken many days to thoroughly examine.

The chief conclusion I came to was that, however greatly an improvement in town planning is needed, it must be helped by an alteration in the labour market. New work is severely handicapped by prices, and until some difference is made we cannot hope to see great developments.

I will not say more on this question, as Mr. Heazell and Mr. Sutton are to open a discussion on this matter on January 3.

I meant to have drawn your attention to the R.I.B.A.'s circular on dry rot, but I think you have had quite enough "dry rot," so I will conclude with the words of a president of a neighbouring association, which struck me as most applicable to the uses of a society like ours:—

"If you asked me the most important function of our society, I should say it was to raise the ideals of the profession to higher levels year by year—ideals of art, of professional practice, of sympathy, and common help."

An interesting discussion followed.

During the evening Mr. A. N. Bromley, F.R.I.B.A., on behalf of the subscribers, presented a silver rose bowl and cigarette case, suitably engraved, to Mr. W. B. Savidge, A.R.I.B.A., as a mark of appreciation of his services as hon. secretary to the society for the past five years.

MANCHESTER SOCIETY OF ARCHITECTS.

ON Wednesday, November 2, the second of the meetings of the session was held, when Mr. Edgar Wood exhibited to the members a fine collection of photographs, fabrics, and tiles which he had collected during a tour made earlier in the year to Constantinople and Athens, as well as some water-colour drawings made during the tour.

On a bird's-eye view of Constantinople Mr. Wood first pointed out the general plan of the city, and indicated the principal buildings, and afterwards described in detail some of the features of Santa Sophia and the mosques which he visited. A very fine example of internal incrustation with tiles instead of marble was the mosque of Rusken Pasha, where the walls are lined with most gorgeous tiles. The general effect he had felt to be disappointing when compared with that of Santa Sophia, for while the tiles were extremely beautiful in themselves they lacked the dignity of the marble treatment which such interiors call for. The tile treatment of tombs and small structures was, however, very fine. Speaking of the impressiveness of the Mohammedan ritual, Mr. Wood described the splendid effect of the lighting of Santa Sophia. There is what he might call a floor of light formed by a plane of innumerable lamps, 9 feet from the pavement, through which the form of the mosaic-covered dome can be dimly seen, and as the walls and piers and anything that would seem to give, say, measure to the height of the building are lost in the dazzling light of the lamps, the effect is one of limitless size and most wonderful mystery. Although the treatment of the apse at Santa Sophia is so successful, the device there adopted of three domed apses opening from the great apse is not followed in the later mosques, where more complicated means are adopted, often resulting in awkward shapes and the loss of the fine simplicity of the earlier form.

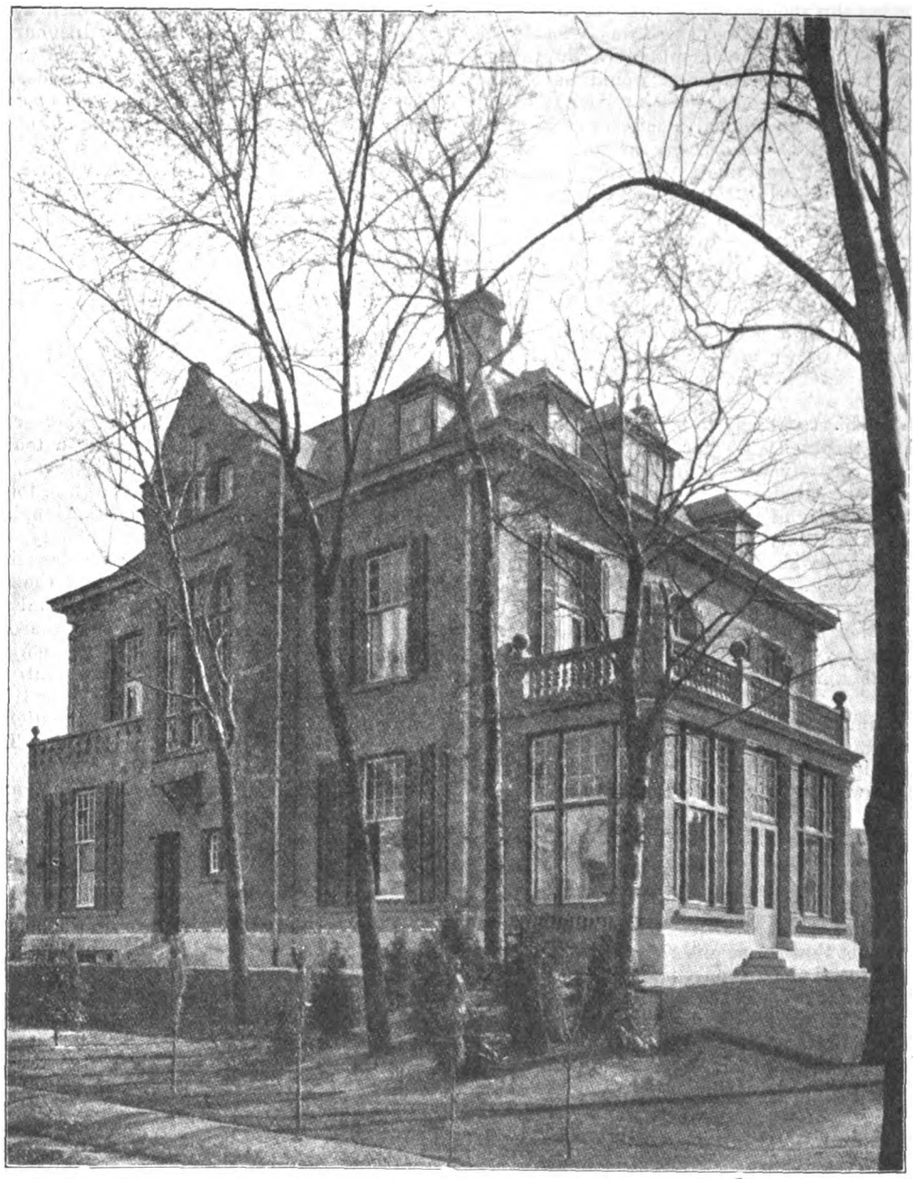
The fabrics and tiles which Mr. Wood has brought home are of great interest and beauty, and members were especially glad of the opportunity of seeing his delightful water-colour drawings of Constantinople and of buildings on the Acropolis at Athens.

COMPETITION NEWS.

ANTWERP.—The jury of eight appointed to adjudicate on the international competition for a scheme for laying out the land surrounding Antwerp to be rendered vacant by the demolition of the fortifications held its first meeting on October 17. Monsieur Aug. Delbeke was elected President. Twenty-seven designs had been received under the following *nommes de plume*:—Brabo, Armoiries d'Anvers, Pour l'Avenir, Projet Réalisable, Métropolitain, Verité, Satyrane, Greater Antwerp, Vires Acquirit Eundo, Main Coupée, Mouette, Grooter Antwerpen, Anvers aux Champs, Coco!, SPQA, Cités Jardins for Ever, Rust Roest, Vel Avulsæ Frondescent, Lutetia, AAT, Antwerpen Boven, Axe de l'Europe, Anvers en Avant, Anneau d'Or, A, Auro, Triangle dans un Cercle. After a summary inspection of the designs the jury spent the remainder of the first day in going over the ground which will become available. On October 18 the designs were criticised in detail, with the result that the following were selected for further examination:—Brabo, Armoiries d'Anvers, Pour l'Avenir, Projet Réalisable, Main Coupée, Mouette, Anvers aux Champs, Coco!, SPQA, Antwerpen Boven, Axe de l'Europe, Anvers en Avant, Anneau d'Or, Triangle dans un Cercle. At a subsequent inspection this list was further reduced as follows:—Pour l'Avenir, Main Coupée, Mouette, Anvers en Avant, Anneau d'Or, and Triangle dans un Cercle. On the following day the jury awarded the first place to the design marked Anneau d'Or, and the second to Pour l'Avenir. A

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MODERN EUROPEAN ARCHITECTURE.
HOLLAND.



[From *Het Huis*.

HOUSE ON THE WALENBURGER WEG, AT ROTTERDAM.—GARDEN FRONT.

discussion then took place as to the advisability of reducing the first premium in accordance with Article 17 of the programme. Some members of the jury, while admitting the great merits of the first design, drew attention to certain serious errors, especially as to the excessive size of some of the public places and mistakes in site plans. By a majority of votes, however, it was decided that the errors were not of sufficient gravity to warrant such a course. The first prize of 1,000*l.* therefore goes to M. Henri Prost, architect, Paris; the second of 400*l.* to Monsieur J. Marcel Auburtin (Pour l'Avenir), architect, Paris; the third of 200*l.* to the authors of two projects called Anvers en Avant and Main Coupée—the first was sent in jointly by Dr. Emeric Forbath, Herr Eugène Lechner, and Herr Ladislas Warga, all of Budapest, Hungary; and the other by Monsieur A. Van Mechelen, architect, Antwerp. The commission finally recommended the purchase for 1,000 francs by the State of the design marked Brabo. The designs will remain on exhibition at the Salle des Fêtes de la Ville d'Anvers, until the end of the month.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) announces that Professor Charles Francis Osborne, of the School of Architecture at the University of Pennsylvania, has assumed editorial charge of our contemporary. A series of articles by Montgomery Schuyler is commenced on the old "Greek Revival" in the United States. The illustrations are devoted to the Union Theological Seminary, New York, of which Messrs. Allen & Collens are the architects.

La Construction Moderne (Paris) illustrates a private house at Dieppe, a design by Mons. P. Selmersheim for the Salon des Arts Decoratifs Français, at the Brussels Exhibition, and some very original designs for metal work by Mons. Félix Gilon.

Arkitektur og Dekorativ Kunst (Christiania) gives some examples of clever planning in the premiated competition designs for the new building of the Kristiania Handelsstands-Forening. The Eidsvolds-monument by the sculptor Vik, in front of the Storthing-house, is also illustrated. Reference is made to the programme of the R.I.B.A. Town Planning Conference.

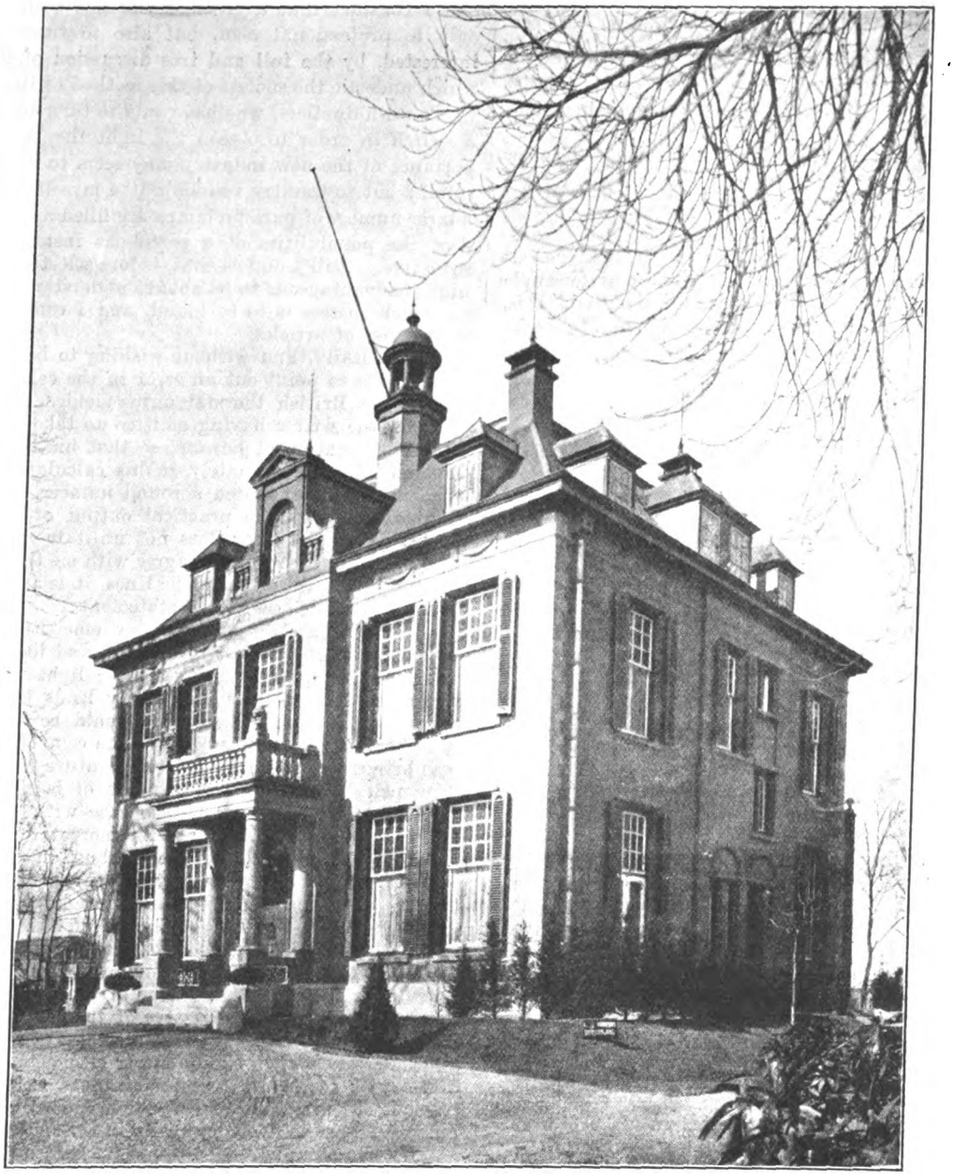
Het Huis (Amsterdam) is devoted to an illustrated account of the artistic exhibits from the Dutch East Indies now included in the International Exhibition at Brussels.

Stone (New York) has a fine illustration of one of the marble panels on the tomb of Maximilian I. in the Hofkirche at Innsbruck, carved by Alexander Colin of Mechlin in 1566. Several instances are given of the failure of concrete structures.

Engineering Record (New York) has an interesting article to those concerned in the scientific designing of reinforced concrete on the bending moments in concrete wall columns and

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MODERN EUROPEAN ARCHITECTURE.
HOLLAND.



[From *Het Huis.*

HOUSE ON THE WALENBURGER WEG, AT ROTTERDAM.—ENTRANCE FRONT.

fixed beams, as worked out by Mr. E. F. Rockwood, of the staff of the Eastern Concrete Construction Company, Boston, and Mr. J. R. Nichols, instructor in civil engineering, Harvard University. The building to which these applied was a two-storey structure 69 feet by 210 feet, used as a sheet-metal workshop.

A STUDY OF BASE AND BEARING PLATES FOR COLUMNS AND BEAMS.

By N. CLIFFORD RICKER, Professor of Architecture, University of Illinois.

(Continued from last week.)

XI.—FOR PLATES OF TAPERED THICKNESS.

THESE comprise all cast-iron base plates, which are always made thinner at their edges for the sake of economy. Bearing plates of cast iron set on walls, however, have a rectangular fracture section, for which direct formulas have already been given. (Formulas 16, 17, 19, 20.)

The thickness required at the middle of a tapered cast-iron plate may now be easily found.

1. Compute the thickness for a rectangular fracture section.

2. Assume the desired ratio $\frac{t'}{t}$ of thickness at edge and middle.

3. By the table, fig. 16, determine the per cent. a of its resistance in comparison with a plate of rectangular section of equal width and thickness.

4. By formula 12 compute the required actual thickness t at the middle of the plate. Then t' is easily found.

Example.—A hollow cylindrical cast-iron column has an external diameter of 6 inches, is ¾-inch thick and transmits a load of 60,000 lbs. to the plate. Required the safe dimensions of a square cast-iron base-plate; fibre stress 2,500 lbs. per square inch; ratio $\frac{t'}{t} = 0.15$; safe resistance of masonry under plate = 125 lbs. per square inch.

$$\sqrt{\frac{60{,}000}{125}} = 21.91 \text{ inches} = \text{side of plate required.}$$

$$nk = \frac{21.91 - 6}{2} = 7.96; \quad n = \frac{7.96}{6.00} = 1.33.$$

For this column, $R = 3.00$, $r = 2.25$; $\frac{r}{R} = 0.75$.

By the table, fig. 12. $L'' = 0.56$, $R = 1.68$ inch.

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By formula 24,

$$t = \frac{1}{28.9}\sqrt{\frac{60{,}000}{21.91}\left(\frac{21.91}{4} - 1.68\right)} = 3.53 \text{ inches.}$$

By the table, fig. 16, for $\frac{t'}{t} = 0.15$ and $n = 1.33$, @ = 71 per cent.

By formula 12,

$$t = \sqrt{\frac{100}{71}} \times 3.53 = 4.19 \text{ inches} = \text{the required middle}$$

thickness. And $4.19 \times 0.15 = 0.63$ inch = thickness at the edge of the plate.

XII.—Graphical Tables.

It is evident from the example just worked out, that the calculations required for any particular base plate are quite simple and rapid, particularly if 4-place logarithms are employed. It is, however, entirely possible to devise a series of graphical tables for materially reducing this labour, thus saving valuable time and lessening liability to errors.

(To be continued.)

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Architects and the Royal Institute of British Architects.

Sir,—May I, through the instrumentality of your influential organ, call the attention of all architects and assistants to the importance of the new departure which the Royal Institute has inaugurated with the object of drawing together into the central organisation every member of the profession throughout the United Kingdom and the Empire, whether now or not yet in practice?

One of the latest acts of our late beloved King was to grant a new Charter with the above object in view, and to create a new class, to be called Licentiates of the Royal Institute.

To this class all professional architects who have been either five years in practice or ten years engaged in the study of architecture are eligible as candidates without examination. Already several thousands have applied for papers, and, as admission to the class is only open until next March, I would urge every architect interested in his profession to make the earliest application for admission. It is the one and great opportunity for securing corporate unity to advance the interests of architecture and of its exponents. The annual payment is but a guinea a year. This confers many privileges, including the free receipt of the Journal of the R.I.B.A., containing the valuable papers read at the general meetings and illustrations of most interesting work, old and new, all over the world. It gives Licentiates a place of call in London, with access to the Library, the best of its kind in the kingdom.

The Institute is only awaiting the enrolment of the Licentiates to make application to Parliament for recognition of all *bonâ-fide* architects, and those who stand aloof are only delaying this application.

Part of the provision of his late Majesty's Charter is to create machinery by which every Licentiate may, if he so desires, proceed to the Fellowship as soon as he is eligible.

All assistants who are eligible are assured of a hearty welcome.

It only remains to add that the allied societies of architects all over the Empire are in sympathy with this great movement, and many have taken, and are taking, active steps to further the objects in view.—I am, sir, yours faithfully,

Ian MacAlister,
Secretary, Royal Institute of British Architects.

[Probably most of our readers have seen this letter before, as it appeared in the *Standard* of November 2. It was received by us after our last week's issue was out on November 4. The R.I.B.A. seems to like its pronouncements brought before professional readers when they are stale news to the general public.—Ed.]

Petrol Air-Gas.

Sir,—I have been much interested in your recent issues containing articles by Professor Smith on Petrol Air-gas, and I consider that a great service has been rendered, not only to professional men, but also to those commercially interested, by the full and free discussion of the principles which underlie the success of this method of illumination.

To town-dwellers, who have only to turn on a tap or move a switch in order to obtain the light they require, the importance of the new industry may seem to be comparatively small; but to country residents like myself, in whose house a large number of paraffin lamps are filled and trimmed every day, the possibilities of a petrol-gas installation are most seductive. Still I do feel that, before selecting a system, it is highly advantageous to be able to understand the main lines on which success is to be found, and I congratulate you on your series of articles.

Incidentally, and without wishing to be hypercritical, I should like to point out an error in the calculation on page 297 of the British thermal units yielded by one gallon of hexane, the writer having omitted to take into account the heat of formation of hexane, so that his theoretical figures are too high. Fortunately in his calculations of cost and efficiency he has adopted a round number of 20,000 British thermal units as the practical output of heat from 1 lb. of petrol, so the error does not militate against the arguments. I am sure you will agree with me that, as the subject is being discussed on scientific lines, it is as well to have the greatest possible accuracy of statement.

The question of candle-power efficiency in relation to calorific value is a most interesting and important one, and the fact that petrol-gas gives more light than coal-gas for the same thermal efficiency really leads to a study of the temperatures obtained, and it would be of value to know whether, using mantles of the same composition, the petrol-gas brings them to a higher temperature than does coal-gas. The petrol-gas has the advantage of being a more perfect mixture than can ever be the case with coal-gas and air, which only mix at the burner; moreover the lower specific heat of the products of the combustion of petrol-gas and smaller proportion of water vapour compared with those from coal-gas, would also result in higher temperatures being produced. This could easily be determined by spectrophotometer or some form of optical pyrometer. This line of investigation is well worth following up, for radiation is according to the fourth power of the absolute temperature, and therefore small increases of temperature of the incandescent mantle result in large increases of radiation intensity - that is to say, in candle-power efficiency.

I look forward to the remaining articles on this subject and enclose my card, from which you will see that I am in no way interested commercially in the subject.

F. I. C.

King Edward National Memorial.

Sir,—As a member of the Council of the King Edward National Memorial I beg to thank you for the excellent article that appeared in *The Architect* of last week supporting the scheme. Lord Tenterden has also expressed his pleasure at the appreciation you have manifested toward the proposals that bear his name. Perhaps it is not generally known that this is the only really national memorial proposed, all the others, even the London one, being local in scope and appeal. This one appeals to the whole nation and the dominions beyond the seas. We are this week planning a world-wide appeal for support. When you can spare us a few lines again, I should like you to let your readers have the names of our principal supporters, but shall esteem it a great favour if you will for the present say that the office of the Council is at 26 Shaftesbury Avenue, Piccadilly Circus, W., that the fund is now open, with the Earl of Kinnoull as treasurer, and that subscriptions may now be sent and particulars obtained from that address. It is proposed that all subscribers of one guinea or more become life members and have free admission to the Palace for life when the scheme matures. Thanking you in anticipation,—Yours faithfully,

November 8, 1910. W. J. Potter.

Mr. C. Charles Campbell, architect, Methil, has been instructed by the Wemyss School Board to prepare plans for a school to be erected in Bayview Park, Methil, N.B.

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The Architect.

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FORTHCOMING EVENTS.

Monday, November 21.

Royal Institute of British Architects: Business Meeting.
Liverpool Architectural Society: Mr. Lionel B. Budden, M.A., on "The Work of Alexander Thompson."

Tuesday, November 22.

British School at Rome: Annual Meeting of Subscribers at the Society of Antiquaries.

Thursday, November 24.

University College, London: Mr. J. A. Gotch on English Domestic Work; Lecture (5) on "The Homes of Queen Elizabeth's Courtiers—Interiors."

Friday, November 25.

Glasgow Technical College Architectural Craftsmen's Society: Mr. John R. Hacking on "Belgium."

Monday, November 28.

Royal Institute of British Architects: Chevalier Professor C. Formilli on "The Monumental Work of the Cosmati at Westminster Abbey."
Architectural Association: Mr. Andrew Oliver on "Cathedrals of Southern France."

ROMANESQUE ARCHITECTURE.—III.

THE fully developed Romanesque is represented by varied phases which, though possessing many characteristics in common, yet are differentiated in expression in the various countries in which they are manifested. Italian, French, and German Romanesque, though members of one family, are not identical, but have their individual idiosyncrasies.

In Italy we may even trace diversities peculiar to still smaller local divisions, as between the buildings in Lombardy and in Venetia. Amongst the most interesting of the Italian examples is the well-known and often described church of San Ambrogio at Milan, which is somewhat fully described and illustrated by Dr. RUSSELL STURGIS,* although the plan is not given. The author makes a special point of the vaulting scheme at San Ambrogio, in which is seen the device of enclosing two bays of the aisle vault in one bay of the nave, thus keeping all the compartments square on plan, a necessary condition for the designer who is restricted to the use of the semicircular arch and one which afterwards became very generally used and characteristic of German Romanesque. Although the groins of the nave vaulting at San Ambrogio are accentuated by arched ribs of brickwork, these are in no sense constructional groin ribs, the vaults being homogeneous and independent of them as much as in any vault of Roman Classic time.

San Zenone at Verona has its nave divided into greater and smaller bays, but the vaulting, if intended—and this seems probable from the importance of the vaulting shafts—has never been carried out, a wooden roof having been substituted. San Michele at Pavia is another example of a similar disposition, and differs but slightly from San Ambrogio.

The front of San Michele, Dr. STURGIS suggests, is a simple and inexpensive substitute for an abandoned more ambitious design. The sculptures introduced for the decoration of the plain wall surface he assumes to have belonged to earlier monuments which have been destroyed. The introduction of sculptures for the adornment of a featureless wall is also to be noted in the front of San Zenone.

In the cities of North-eastern Italy, under the dominion of Venice, there is nearly as strong a trace of Eastern art as in the city of Venice itself, which is due to the control of the emperors who reigned at Constantinople. The church at Pomposa is one that has retained most completely the Oriental influence, and here again we find an instance of the inclusion in the wall face of earlier sculptures. In the church of SS. Maria and Donato, on the island of Murano, in the Venetian lagoon, are also to be seen inserted sculptured panels of generally Byzantine type, together with inlays in the brickwork of flat polished slabs of rich coloured marbles.

Due to Byzantine influence was, undoubtedly, the treatment of some of the earlier Venetian secular buildings—the Fondaco dei Turchi, the Palazzo Zorzi, and the Palazzo da Mula at Murano.

Campanili are touched upon by Dr. STURGIS, who especially commends the bell-tower of SS. Trinita at Verona as one of the most beautiful of the many in that city, both in proportion and in detail. San Gottardo at Milan, with its octagonal form, is another to which the author draws special attention as one of the very few successful towers of other than square ground plan.

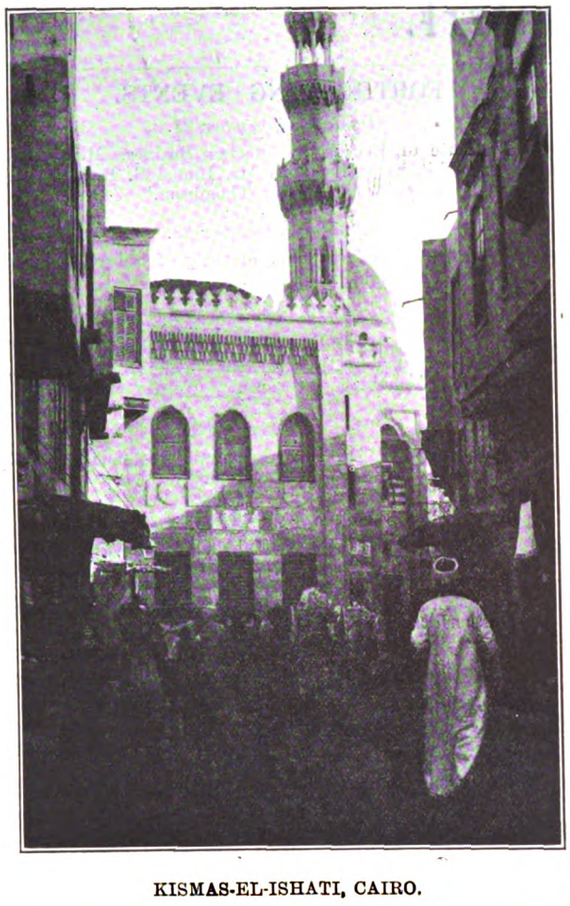
In speaking of the octagonal tower over the crossing of the abbey church of Chiaravalle, near Milan, with its series of successively diminishing octagonal towers, we are told that it has been suggested that the famous and beautiful cathedral of Florence, roofed in 1425 by the dome of Brunelleschi, was to have been finished by a receding tower like that of Chiaravalle. St. Sernin at Toulouse may have been inspired by Chiararvalle, as it adopts the same principle with even better effect.

Pisa, as the greatest example in Italy of the fully developed Romanesque, receives a lengthy description from Dr. STURGIS, who tells us that although begun early in the eleventh century, it had a fresh start from 1063, at which time the whole scale of the church was changed. The historian rather praises the design of the west front of the cathedral, glossing over the monotony of its repeated tiers of arcading, and laying stress on the slight change of scale in the west wall of the clerestory. Reference is made to Professor GOODYEAR'S investigation of the refinements or departures from normal alignment in this cathedral, which by the convergence of apparently horizontal lines produce a more pronounced perspective, giving a seemingly greater length to the nave.

Special praise is awarded to the west front of San Michele at Lucca, in spite of a lament over its restoration, and we are told that nothing is finer in the Romanesque style than the proportion between the arcades of the different storeys of the front, but exception is taken to the decoration of the wall surfaces above the arches of those elaborate arcades. The west front of the cathedral of San Martino at Lucca is characterised as probably the finest example that we have of the complete central Italian Romanesque. The asymmetrical disposition of the arcades does not receive any adverse comment from the author, who styles MAESTRO GIUDETTO, its designer, a great and daring architect who has made the overwhelming mass of the bell-tower serve to formalise and rectify the rather loose and offhand grouping of his arcades.

* *A History of Architecture.* By Russell Sturgis, A.M., Ph.D., Vol. II.—Romanesque and Oriental. (New York: The Baker and Taylor Company. London: B. T. Batsford. 25*s.* net.)

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KISMAS-EL-ISHATI, CAIRO.

In summarising the Italian Romanesque of the eleventh century Dr. STURGIS enumerates the strong and easily traceable Venetian spirit, the magnificent Tuscan Romanesque, and the inception of a grave and stately style in Lombardy, but, he says, not one of these has reached final maturity. Further north, in the plain of Piedmont, there are interesting examples of Romanesque at Andorra and at Lavagna, both near Genoa, at Casale and at Asti; while more northward still, in the hill country at Aosta and the less-known towns of that vicinity, or along the shores of the Lake of Como, there may be found Romanesque art in unaltered abundance; but not in North Italy can we look for the traces of a perfected style during the eleventh and twelfth centuries. In the south there has been too much of the strong influence of the Norman invaders of Sicily to allow of undeniable conclusions, although Troia, Trani, and Ruvo all mark a period of Romanesque art nearly contemporaneous with the early Gothic of France.

The churches at Toscanella possibly indicate, in spite of later alterations and restorations, such a tendency as, if it could have controlled Central Italian art, might have produced a consistent national style developed on Romanesque lines.

NOTES AND COMMENTS.

WE were pleased to learn from the address of the President of the Royal Institute of British Architects that following on the successful Conference "it is proposed to hold shortly a much smaller gathering, composed entirely of experts." This gathering will be very small if it is limited to those who in this country have proved themselves experts. We do not count as such those who have merely drawn parallel straight lines on the maps of our cities, or even those who have talked about town planning. Many of us now, thanks to Mr. RAYMOND UNWIN and Mr. JOHN W. SIMPSON, know something about town-planning, but we are bound to confess ourselves tyros alongside the architects of America, Germany, France, and Sweden. The proof of the position of British architects at present is demonstrated by the result of the international competition for the expansion of the city of Antwerp. The English designs, we understand, were knocked out in the first round.

LIVERPOOL'S Bevington Street area improvement of which Mr. JOHN BURNS laid the foundation-stone on Saturday last, is an essay in the replacement of slumdom by a combination of block dwellings in flats and single-house cottages. Considerations of finance have hitherto usually prevailed in the past to limit the newer dwellings to block tenements, so that the experiment of the Liverpool Corporation is a bold departure. The new dwellings will comprise fifteen blocks, containing 226 tenements, which, it is estimated, will accommodate 1,372 persons. There will also be fifty-two self-contained cottages of five rooms each, twenty-seven four-roomed, seventy three-roomed, and seventy-seven two-roomed dwellings, together with a superintendent's house and office, and six shops. Another feature of the scheme is the provision of two large playgrounds, one for boys and one for girls, with a centre portion laid out as a garden, with band-stand and two shelters. The band garden will cover 1,000 square yards, while the playgrounds are both 1,200 square yards, and will be fitted with suitable gymnastic apparatus, such as swings, giant strides, and see-saws, and at the entrance to each ground a drinking fountain will be placed.

WHEN the Bevington Street area was scheduled in 1907, the number of houses was 295, of which 267 were insanitary, back to back, and located in narrow and ill-ventilated courts. The total contents of the area was 17,989 square yards, and the freehold of the land and buildings, including trade compensation, was acquired at a total cost of 52,000*l.*, or 2*l.* 17*s.* 9*d.* per yard.

CONSIDERING that in the last twenty years Liverpool has spent nearly a million of money and has rehoused 11,000 people in healthy dwellings, Mr. BURNS had some justification in saying that Liverpool was doing more in proportion to its liabilities and conditions than any other town in the United Kingdom to improve the housing conditions of the people. The Bevington area scheme is in no sense a garden city affair, but there is a sound exposition of good town-planning in the placing of the block dwellings on the outside and lower cottage-houses in the middle. It is estimated that the net cost will not exceed a rate of ½*d.* in the £, which is not extravagance but good municipal investment, as the better housing conditions cannot fail to lessen the expenditure on hospitals, asylums, workhouses, and gaols.

THE good results of the Town-Planning Conference are reflected in the reports of their representatives that are now being received and discussed by the various municipal and other local bodies who sent delegates, and of these the sentiments expressed by the deputation from the Northwich Urban Council are a good example when they said in their report:—"It is of the utmost importance that every local authority should appoint a Town-Planning Committee who shall make themselves thoroughly conversant with the duties and obligations of these authorities in regard to this matter, and thereafter to consider how the opportunities afforded can be taken advantage of in the best interests of the districts. During much discussion the instruction received by your representatives as a result of the conference held on the subject will be of great value. A lively interest has at last been awakened in our country on this most important matter, and though we have been left behind by continental countries there is no reason why we should not, profiting by their experiences, overtake them in the march of progress, and make our England still more an example for good in the eyes of the whole world."

THE report of the representatives of the Heriot Trust, Edinburgh, contains some fair criticism of the Conference, and states that many of the delegates attending the Conference felt, and not a few expressed, the view that the

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papers read were too theoretic and academic, and that too little attention was paid to the economic and practical difficulties which call for solution. It is pointed out that it is, of course, easy to make suggestions for public improvements at the expense of other people, but the acquisition of land by local authorities at fair prices need not be a disastrous investment. Probably the most useful effect of the Conference, it is stated, has been to direct public attention to, and to stimulate discussion upon, the objects of the Town-Planning Act. The creation of a better ideal and a strong public opinion upon the better arrangement of cities and the housing of the people will greatly facilitate the operation of the new Act. It is quite clear that the attempt to achieve the objects in view by uniform provisions has failed, and that no general conditions can be laid down applicable without exception to the varying needs of different localities. Each town or district must have its own scheme to suit its peculiar requirements and circumstances. One principle unanimously concurred in at the Conference is that local authorities must apply their minds to the provision of spacious main arteries for traffic from the city to its suburbs. It was apparent from the speeches of many of the delegates that the problems to be dealt with are more clamant in many English towns and cities than in Edinburgh, and that that city is far ahead of the average in width of streets and provision of open spaces, parks, and gardens.

Mr. G. Gilbert Scott's revised design for Liverpool Cathedral appears to be a bold conception with a central tower over 100 feet square and 250 feet high, providing a great central space 187 feet by 87 feet without a single pillar, and a seating capacity for 4,000 worshippers, in addition to the choir, which holds 2,500. The total accommodation of the existing design is for about 8,000 worshippers, and the new scheme will provide for about the same number, but readjusts the space, so as to give a great nave to hold a grouped congregation, intended to make the sacred building a great preaching Cathedral.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held at 18 Tufton Street, Westminster, on Monday evening, the 14th inst., Mr. Arthur Keen, President, in the chair. It was held jointly with the Camera, Sketch, and Debate Club. This new departure was noteworthy for the excellent attendance and the interest of the discussion which followed the reading of the two short papers.

Mr. Edwin Gunn, Hon. Secretary, announced that the next meeting of the Camera, Sketch, and Debate Club will be on December 1, at 7.30 p.m. (Ladies' Night), when a paper will be read by Miss L. A. Dunington, entitled "The Principles of Garden Design." He also announced that the Athletic Club Dance will take place on December 15 at the Whitehall Rooms.

Mr. Arthur Keen, the President, proposed a vote of thanks to Mr. Christopher W. Whall for presenting a copy of his book on "Stained Glass" to the library. He then announced that the Annual Conversazione will be held at 18 Tufton Street on Wednesday next, the 23rd inst., at 8 p.m. There will be an exhibition of drawings and sketches.

Mr. Gerald C. Horsley, F.R.I.B.A., then read the following paper, entitled

That Fine Draughtsmanship Conduces to Fine Architecture.

"It is foolish and insolent to imagine that the art which we ourselves practise is greater than any other, but it is wise to take care that in our hands it is as noble as we can make it."

I quote these lines from the "Stones of Venice," as they express something of the feeling I possess concerning the relation of fine draughtsmanship to fine architecture. That is to say, that as my business, as it is your business, is with the art of architecture, and, in Ruskin's words, "it is wise to take care that in our hands it is as noble as we can make it," we must agree that everything which contributes to the making of architecture should be of the very best. We must, I think, admit that drawing plays a large part nowadays in the producing of architecture, and that it is essential, if the architecture is to be good, that the drawing should be good also.

In short, if our architecture is to be noble, the means employed must be noble also, and one of the means undoubtedly is draughtsmanship.

We have, then, to regard draughtsmanship as a means to a noble end. Draughtsmanship will not by itself produce fine architecture, but if rightly applied it will contribute to its production. If architecture is the "Mistress Art"—and I am far from denying it—then "fine draughtsmanship" is one of her handmaidens, one of many who combine in duties which make possible the perfection of the Mistress Art herself.

The importance, indeed, of draughtsmanship may be realised when we remember that we are obliged nowadays in the practice of our art to make a very much larger number of drawings than was expected of the architect in past ages.

I can conceive it possible that someone here to-night will condemn this undoubted fact as a tyranny which we have no right to accept, and that he may implore this Association to use its influence to turn architects from the drawing-board, and to drive them—as a friend once put it—"to the scaffold." But with what object? We shall agree that the architect should spend the requisite time in acquiring a working knowledge of the handicrafts in building. As a student he cannot for this purpose do better than spend some part of his time in a builder's yard, or as a clerk of works on a "job," but it is not necessary for him to spend his time when in practice in usurping the proper functions of the bricklayer, or the mason, or the builder's clerk in buying cement in the cheapest market. His real business is to be the master builder, and his chief office in that high office is to be a man of ideas. As Mr. John Belcher has pointed out, we can liken the functions of an architect to those exercised by the composer of music for the orchestra; the composer who combines and weaves into his composition the sound of many instruments, a man who in order to bring about the best result in his work has taken pains to become acquainted with the capabilities and the working of each instrument of the orchestra.

If, then, the architect is the master builder, the man of ideas, those ideas must be worked into terms of building, not on the scaffold, but at the drawing-board. This implies the close apprenticeship to board and T-square which we all know, and to which we are faithful all our lives.

Draughtsmanship, therefore, rightly used, is a necessity of our time, and in the best interests of our art it should be as good as we can make it.

There are two reasons which especially warrant me in making this statement. The first, and the most important, is that skill in drawing, once it is really attained, becomes a living mental force to the artist, an added force to his mental equipment. You will perhaps realise how true this is when I say that a man who is a fine draughtsman will regard all objects within his view with a higher and a more just appreciation of their qualities than a man who is an indifferent draughtsman. The importance of any added mental force to the architect must be great when we remember that the processes of designing are mental, that the architect creates his design out of his knowledge and imaginings. He sees the plan of the house or the church, the scheme and "lay out" for the public building, spread out before him in his mind, each part thought out and mentally corrected before ever it is laid out in material form on paper.

If, in following out the latter process, he draws out the design crudely, clumsily, hardly, and unsympathetically, the spirit will have fled from the thought; the bones and body of the scheme may certainly be there, but the soul will not, and to the spectator the project will be unattractive.

If, on the other hand, the architect has fulfilled his chief function of being a man of ideas, and has incorporated into his scheme just that touch of genius which may make him worthy of the title of architect, then, if in drawing out his scheme the hand follows the brain in the transmission of the design to paper, and if the two work in sympathy, each touch of the pencil expressing as it were the very thought of the brain, then will the spectator rightly understand the end and aim of the artist.

Excellence in drawing, therefore, has an educative influence upon us, which, in our desire to train ourselves as capable artists, we cannot afford to neglect.

My second reason for the statement I have made can be more briefly put before you. It is nothing more or less than that history and past experience show that the best architects have generally been admirable and first-rate draughtsmen. This is a statement which can be amply substan-

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tiated; a consideration of these architects and their work in drawing will give the proof.

Thus, very inadequately I fear, I have put before you a general statement of the relation of fine draughtsmanship to fine architecture. In conclusion, I would like to refer to some of the technical qualities which the words "fine draughtsmanship" comprehend. I think we should give the words a wide interpretation. It is of the essence of good draughtsmanship to express character, and character in a drawing will out in different ways. We cannot drive draughtsmanship into too narrow a road and say, "This is draughtsmanship and no other." Yet a high standard we must have. Among others, we must apply the following tests—(1) Is real skill shown in the drawing? (2) Is there beauty in the line? (3) Is the character of the building or the design clearly and ably expressed? If we have passed through some of the severities of the mill ourselves we should be able to answer these questions.

Permit me to quote once more Mr. Ruskin to you in this connection. I make no apology, because, besides being an interesting draughtsman himself, he made a study of the whole question. He said, speaking of an artist, "it is in the perfection and precision of the instantaneous line that the claim to immortality is laid." The "perfection and precision of the instantaneous line"—does not that mean the sure and certain touch, the nervous line pregnant with character and restrained force? Again, he says on this subject of the line—the work of the hand impelled by the brain—"the first merit of manipulation is that delicate and ceaseless expression of refined truth which is carried out to the last touch and shadow of a touch, and which makes every hair's breadth of importance and every gradation full of meaning. It is not, properly speaking, execution, but it is the only source of difference between the execution of a commonplace and that of a perfect artist."

This question of manipulation is thus of the utmost importance, and rests at the root of the matter. Our small-scale and detail drawings, to be alive with meaning and intention, must be perfectly expressed by the "perfection and precision of the instantaneous line," clean, firm, and sharp. Our full-size details must be drawn with even greater subtlety of expression than the small-scale drawings, the greatest care being necessary to express the spirit of the design in the contour of the mouldings. Let us remember that our working drawings are not only items of direction to the workmen under us; they are more than that: they should convey to their minds the very spirit and heart of our design. In the same way, the sketches we make for our clients, to show the grouping of our designs, should not be mere diagrams: they should be drawn with intelligence and care, to create an interest in our purpose and an understanding of our aim.

In a masterly manipulation or execution we shall find truth, simplicity, and the mystery of inspiration. These qualities must all be present together in our completed drawings, particularly in our measured drawings and sketches, and in the drawings we should all make from the life.

Experience proves that if we do not measure and do not sketch we bid fair to be very poor architects. In this Association, with its splendid tradition and practice in sketching and measuring, it is not necessary to dilate upon the importance of either. We all know that the best way to study a building is to draw it, and that not till then shall we discover matters of detail which otherwise we should not have seen. As to the necessity for an architect to draw from the life, let me tell you what Sir William Richmond has said on this matter:—"The artist who can delineate the beauty of the human form, who is scientifically conversant with its structure as a machine, is possessed of a power limitless as art itself. He can design a picture, make a statue, or build a cathedral. This is a startling assertion, but it has been proved over and over again to be a true one. The artist who is not possessed of this power is minus, I was going to say, everything."

We must at least agree with Sir William that the power of design in many an artist has been fostered, or created, if you will, by study in the life class. In no other school is it possible to learn more valuable lessons in the principles of proportion, or in developing the knowledge and appreciation of the close kinship which exists between the art of the architect and the art of the sculptor. The relationship between the qualities of fine sculpture and those of fine architecture is a subject apart, but so far as the study of this subject tends to the production of fine architecture, drawing from the life will worthily assist towards comprehending it.

A few years ago, in trying no doubt to carry out some recommendations given in the first syllabus of the Board of Architectural Education, an attempt was made in some of our schools to decry the claims of fine draughtsmanship. Drawings, we were told at that time, were to be regarded almost wholly as diagrams, and by no means as instruments of pleasure, radiant with the beauty of draughtsmanship in its expression of the spirit of the design. Fortunately it was a movement which has not spread very far, but so far as it has gone I consider it mistaken, and that it has done harm, for it has led a proportion of our students to adopt a style of draughtsmanship which is hurried, scrappy, and unfinished, and consequently without either character or charm. The situation which was thus created is really an impossible one, and we are curiously reminded of the result of some old Puritan fulmination against any joy in work or life. It is wholly at variance with the teaching of the best artists of all time, who have one and all been at least consistent in insisting that an artist should take pleasure in his work, producing it "under the instinct and passion of an inner commanding spirit."

We may be grateful to our French friends for some change of view in this matter, for since the exhibition in London of the splendid drawings of Selinunte by Mons. Hulot we have heard less of this unfortunate attitude towards fine draughtsmanship, an attitude probably born of an unnecessary fear lest the student should give too much attention to the technique of his drawing, and neglect more important qualities in his design. If we carry out conscientiously the true association of brain and hand we shall avoid, I think, the danger of allowing our facility in drawing—if we are so fortunate as to have any—to run away with us. Every accomplishment has its accompanying dangers and temptations, and to counteract these we must bring into play such sanity as we possess throughout the whole of our careers.

Mr. Halsey Ricardo followed, and said: When my friend, Mr. Horsley, invited me, for the sake of discord and discussion, to adopt the position of *advocatus diaboli*, and do my damned (with respect be it spoken!) worst to traverse his position, I was beguiled into accepting the charge, and seemed to fancy that I could summon up some infernal spirits to aid me in the matter. I supposed that by "fine" draughtsmanship he would be alluding to that kind of drawing that has a tendency to be an end in itself, a tendency to construct a picture, not a workman's tool. But whilst he glances with an indulgent eye at this painter's ideal, he protects himself with so many sensible and unimpeachable safeguards to his—may I call it?—academic position that it's the devil (and not I) to know how to make any successful assault upon his eminence. To begin with—at the bottom we are agreed—an architect has got to express himself, and mainly by drawings, and therefore he must know how to draw, and how to draw with facility. The divergence, if there is any, comes when we attempt to define how far such education in drawing should be carried. To draw with facility means a long apprenticeship in a severe school of accurate notation which enables you to use your pencil or your pen as the final tentacle of your brain with the swiftness of thought. The pencil is but the extension of your fingers, which are but the prolongation of your arm, which is the channel through which the nerve movement comes from the brain, and the action of the pencil should be as automatic (in a sense) as the bat in the hand of the cricketer or the gun in the hand of the sportsman. Because, mind you, it's the placing of the cricket ball or the mortal wounding of the animal that is the real end. It doesn't matter if the bat handle is sprung or the blow came from the extreme end of it so long as the ball goes where you mean to place it, outside the boundary; so it doesn't matter whether you are using ball cartridge or powder and shot, or whether your powder is smokeless or cloudy, the hitting your mark is the real thing, and hitting it decisively. Consequently I demur to the quotation from Ruskin about "the instantaneous line" as not being apposite; his definition that "it is in the perfection and precision of the instantaneous line . . . that delicate and ceaseless expression of refined truth which is carried out to the last touch and shadow of a touch, and which makes every hair's breadth of importance, and every gradation full of meaning," applies to the case where the line is the end in itself. With the architect the building is the end, and his drawing is but one of the many tools requisite to achieve that end. "His real business," Mr. Horsley says, "is to be master builder, and his chief function in that high office is to be a man of ideas." Quite incontestable. But not, I think, what follows, "Those ideas must be worked into terms of building, not on the scaffold, but at the drawing-board." It depends a good deal on the construction we put upon the word "worked." Of course,

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a great deal of contriving and explanatory work must be done at the drawing-board, but the ideas (as Mr. Horsley has rightly said) are a brain concept, "thought out and mentally corrected before ever it is laid out in material form on paper." And the value of these ideas depends on the more or less perfect response they make to the conditions of life they have to answer, and to the qualities and limitations of the materials that have to be used. And for this the mind does not require draughtsmanship, but observation and memory. You think of the forms you are going to use, and you afterwards draw them out in order to convey to some one else what is in your mind; and also, since the matter is too complex and the external conditions too many to be carried accurately in the mind, there is a need for setting them out on paper and studying the different values of these conditions, and so finally reaching that delicate equilibrium that one calls a design. But all this while you are thinking in three dimensions, and the pencil is merely registering your thoughts as they take shape. Directly the pencil begins to suggest or dictate the shape, it is usurpation, and disastrous usurpation, since the pencil's function is to be recorder only, not inspiriter. As soon as the eye, and the mind behind it, begins to dwell on the decorative or artistic appearance of the lines put on paper it is beginning to drift off into side issues. Down this mistaken road stand the examples of picturesque buildings, and that sterile accumulation of "paper" architecture, that architecture that is corroded with considerations that appear only on paper, not in real life. I am not, of course, condoning slovenly or inaccurate draughtsmanship; it cannot be too careful and too exact, and I am ready to allow some slight idiosyncrasies in the practise of it, like as I am always touched by the beautiful rounding and considerate embellishment of the joiner's plane. One should be able to take a pride in one's drawing, and having turned out a thoroughly workmanlike affair, but it is not to be a picture. So, again in sketching a diagram, to explain some piece of planning or construction to the workman one wants practised facility to show the essentials of the problem, and to put the ingredients of it in the clearest way. The art of choosing the point of view, and displaying just those parts and just those connections which the builder really wants to know is not an easy one, and the answer to his difficulties must be seen first before ever it can be drawn; and one sees it as the artisan sees it, with tool and material in one's mind's hand, and one goes through the process of solving the problem in the way that one wishes him to follow, and the drawing should put this before him unmistakably clearly. Such diagrams as we find used by Professor Willis, Viollet le Duc, and Choisy are admirable illustrations of what I mean. In this way we may manage to convey to the workman's mind "the very spirit and heart of the design," and the more diagrams of this kind that we make the better. They clear the air, force us to dwell on the muscular anatomy and bones of our buildings, and so give them that physical structure that causes the finished surface to look, like a human being, sensitive and alive.

The joiner's plane, in a humble way, is a work of art; its shape is due to much practice, to much trial, to much affectionate handling, and the outcome is a beautiful tool. But its function is not to look well on the shelf or graceful upon the plank; the accurately smooth board is its justification, and the easier and the swifter it does its work the more its praise and the more its value to the joiner.

Sketches—besides constructing this facility of hand and teaching one what to represent as vital and what to omit as merely accessory—are an unrivalled means of imprinting on one's memory such architectural composition as may have interested us; no photograph has the same power, nor the same personal selection; but I am inclined to advocate that soon after the sketch has been made it should be destroyed; its work is done; if it hasn't made the lasting impression that was expected, the reasons for its failure are sufficiently adequate. About measured drawings it is quite a different matter. These should be made, not for oneself only, although the analytical knowledge of construction obtained in making them is a splendid education, but also as adding to the general stock of trustworthy records concerning things that can never be replaced and are surely getting destroyed. The devotion necessary to sympathetically portray the subject chosen gets a kind of sanctification when you reflect that you are working also on behalf of all lovers of architecture, of art, and of history, that by your careful delineation you are constructing a simply invaluable record, accessible to all students, and it may be eventually the one trace left of all that you have thought so charming. And with this aim before you, this ideal of portrayal, the hand will be always holding the pencil in check; it is easier to be suggestive than to be downright, yet it is one's charge to mark down mere matter of fact rather than what one might fancy may have been the intentions of the builders. The very limitations and imperfections, other than those resulting from the ravages of time, weather, and man's destructiveness, the unabashed contrivances, are all so much history, the key to which is in the stones themselves. Nay, history itself, without these monuments as exponents, can only be imperfectly read and understood.

Mr. Horsley affirms "that history and past experience show that the best architects have generally been admirable and first-rate draughtsmen." Well, statistics on this head are idle, and Mr. Horsley very prudently shelters himself behind an inserted "generally" in his pronouncement. We must consult our own experience and our own retrospect of history. In England the architect is not discernible as such until the days of Inigo Jones, and there are no scraps of his handiwork to enable us to form an opinion as to his draughtsmanship. Such architectural studies as can be examined of Leonardo da Vinci, Michelangelo, and Sir Christopher Wren might have been drawn by anybody—me, in fact. The two former were, of course, unrivalled in their powers of draughtsmanship, but they didn't spend it conspicuously on their architectural drawings; it is noticeable in Michelangelo's and Raphael's case what a lot of shorthand, so to speak, they used; they couldn't spare the time to indicate more than the three divisions of the entablature, for example, or the mere bell and abacus of the cap, that was to be floridly composite when carved. Coming to my own time, I may say that the two masters to whom I was successively apprenticed were neither of them "fine draughtsmen" in the usual sense of the word, though they had draughtsmanship enough to make their intentions perfectly intelligible; and the most individual and romantic architect of our time, Mr. Butterfield, was, to judge by his notebooks, no great hand as a draughtsman, and worked, so far as his working drawings were concerned, through other men's fingers. That one's drawings should give us pleasure in the working is no more than right; done *con amore* they will probably be more explanatory than those regarded as so much taskwork, and in these days of photographic reproductions, facsimiles, not copies, of the originals reach the workmen's hands. One likes to see a clean, tidy, straightforward drawing, free from affectation and easily legible, just as one likes to see the big jackplane in the carpenter's hands, but there may be many opinions as to how tidiness, legibility, and straightforwardness should show itself, and to some extent in these chaotic days each individual must be something of a law unto himself. We might, I think, with advantage extend some of the canons of conventional representation, and by building up a tradition on some accepted uniformity, as, for instance, in colouring, so making our drawings more universally and more quickly intelligible; but this consideration takes me away from my imposed function, which was to be the *advocatus diaboli*, and if in this I have been at all successful, why, then the devil's in it.

Mr. Ernest Newton contributed the following observations, which were read by Mr. Arthur Keen, the President.

Mr. Newton said that, though agreeing in the main with all that Mr. Horsley said as to the merit of clear, accurate draughtsmanship, he thought that the great value of fine drawing was as training to the eye and the mind. To many students in their early days architecture was rather a dry study of brick bond and beams and girders, with occasional excursions into the higher regions of the "Orders." They had a vague feeling that some day they would know how to do everything, but they were altogether indefinite as to how this knowledge was to come—how and when they would have the power of selection, discrimination, and criticism. Careful and systematic drawing would be a sheet anchor to them. The growing sense of mastery of a difficult art would give them confidence, while at the same time developing powers of discrimination and criticism which would be invaluable later on. Careful sketching of old buildings would be a delight instead of a task, and the road to efficiency would be made shorter and infinitely pleasanter. Slovenly draughtsmanship generally went with slovenly thinking. Of course, there was always the danger that a good draughtsman would fall in love with his drawing, that he would forget that he was designing a building and not making a picture; but one or two little lapses of this kind would be enough to cure him of this bad habit. After the building had been constructed, and with this danger guarded against it might, he thought, be accepted as true that anyone making a beautiful drawing of a building he was designing would

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take so much pleasure in it that his mind would act in harmony with his hand. There was no rule without its exception, and it was quite possible, indeed we knew it was the case, that the very efforts which an inexpert draughtsman had to make to put his ideas on paper led him to concentrate so much on the building he had in his mind that, in spite of the handicap of weak draughtsmanship, his buildings would not be inferior to those of his more expert brethren. The untrained draughtsman was like a one-armed golfer. We often heard of these one-armed men making wonderful scores, but that was no reason why we should cut off one of our own arms; most men could play better with two! Again, an architect who was a well-trained draughtsman had an inexhaustible capital, and would go about the world with the quiet confidence of the man who in other walks of life counted as his great asset a large balance at his bank.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

THE opening general meeting of the Society was held at the Queen's Hotel, Leeds, on Thursday evening, November 10, when the President, Mr. Sidney D. Kitson, M.A., F.R.I.B.A., delivered his address.

Gentlemen,—I should like to begin my address to you to-night by saying how much our Society appreciates the untiring work which our late President has devoted to its interests. A few words of appreciation also are due to the unfailing courtesy and tact with which our late Secretary conducted our affairs. Mr. Kirk gave up, without complaint, a considerable portion of his time for a long period to the work, and he has trained up his successor to fill his position. Our Society has always been particularly fortunate in its secretaries, and in Mr. Ralph Thorp, the son of its first Secretary, we have a man who, if I may say so without offence, seems to have been "bred to the job." As everyone who has seen anything of the working of the Society knows, it is upon the shoulders of the Secretary that the whole of the labour and responsibility falls. I do not propose to add to the sadness of his burden by addressing you at any great length to-night. He, at least, is obliged to sit out my remarks, but with the rest of you it is entirely optional. There was a custom in Mediæval Rome whereby a certain section of the citizens were obliged on Holy Thursday to attend a sermon which was preached for their edification by a Bishop especially appointed for that purpose. Our Society also has its Holy Thursday, when the person whom you are good enough from time to time to appoint has the privilege of preaching you a sermon.

Without being marshalled in the city square and obliged to attend, you do accord of your own free will, and not from compulsion, as in times past, a silent and, more or less, respectful hearing to the views of your President for the time being on matters of current architectural interest and ethics. Your President has therefore for at least once in his life the privilege of speaking as though from a pulpit, without the fear of immediate or, at any rate, audible contradiction.

That this privilege has been thoroughly appreciated in the past one has only to look through previous presidential addresses to realise. Indeed our interests and ethics have been so well handled by past Presidents that it almost seems that there is nothing new to say. Here, however, the advantage of the sermon comes in, for most of the things said in sermons are not new, and some of the new things are not true. I shall try to confine myself to the truth, and therefore you will not expect much that is new.

And first with regard to our own Society, I can imagine, even if I have not actually heard, the reply of a young architect on being asked to join: "What good is the Society to me?" Let us answer that question. It is an old commonplace, but none the less true, that union is strength. This commonplace truth has been acted upon by all trades and professions except, I believe, that of domestic servants, with the result that every trade is in a position to-day to assert its rights and to resist abuses to which, without that union, it would be a prey. Our Society is federated with the Royal Institute of British Architects, and thus forms a branch of the official guardian of the architects' interests in this country. The long controversy which has been waged round the question of registration seems now to be dying down in the very general recognition of the fact that the legal registration of architects will be to the benefit of the profession and also of the art which we practise. By loyal membership of our local Society the hands of the Institute are strengthened, and the time that must necessarily elapse before the goal is reached will be appreciably shortened.

Corporate unity will never supply the place of individual character and energy—a fact sometimes lost sight of by trades unions—but individual capacity cannot attain its full development in a position of islolation. Our Society affords opportunities for architects to know one another better; we can discuss our several difficulties, aspirations, and beliefs, and thus create a saner and healthier atmosphere than is to be obtained in an attitude of aloofness. Our lectures give us the opportunity, not always sufficiently appreciated, of hearing the opinions of experts upon the manifold aspects of our art. Our new rooms, far more centrally situated, in the Leeds Institute have been made attractive by the Secretary and Mr. Procter, who have hung upon the walls water-colour drawings and sketches which have been generously given by their authors, all members of our Society. And it is hoped that these rooms will long prove to be a common meeting-place for all the members of the Society upon a footing of cheerful and friendly equality.

The Council watches carefully over the interests of all members, and endeavours to advance the position and prestige of the profession in the province which it serves.

Such are some of the reasons why every young architect within our area should join the Society. Instead of his question, "What good is the Society to me?" he will ask himself, "What good am I to the Society?" and he will proceed to answer that question by unselfish personal service to the Society, thereby advancing the interests of the art he professes, and incidentally making himself a more useful member of the community.

The Council of the Society has formed during the past year a Town-Planning Act Consultative Committee, with Mr. H. Ascough Chapman as its secretary. It is hoped that this committee will prove of value in the discussions of schemes which may from time to time be brought forward under this Act. The controversy which raged round the Act whilst it was still a Bill has now vanished, and friends and opponents alike are agreed in the endeavours to make the Act workable and efficacious.

The best argument in favour of the Town Planning Act which exists is our West Riding towns themselves, which, from industrial villages "without form and void" have been allowed to expand anyhow, without thought of the future, or, at any rate, without the statutory power to make that thought operative.

A hundred and fifty years ago the author of perhaps the finest poem of the eighteenth century, the "Elegy written in a Country Churchyard," wrote to a friend that, after a long and enthusiastic day spent at Kirkstall Abbey, "he lay that night in Leeds, a smoky, ugly, busy town." Gray's description still holds good to-day. Leeds is still a smoky and, therefore, an ugly town; and, so long as our buildings take upon themselves within a year after erection, a permanent coating of dismal black, it is almost unreasonable that the public should be expected to pay for good architecture.

An eminent London architect was written to some years ago by our then Honorary Secretary, the late Frank Bedford, to ask if he would lecture before our Society upon some architectural subject. His reply was in the negative, and he added, "What you require in Leeds is not architecture, but a hose pipe." It must be admitted that his reply, without being aggressively polite, contained some germs of truth, and I firmly believe that our posterity a hundred years hence will shudder at our barbarity in enduring the atmosphere which we now endure, just as now we shudder at the barbarity of our ancestors who endured, or even enjoyed, cock-fighting, bull-baiting, and public executions. Putting on one side the loss of self-respect and the general lowering of vitality which our atmosphere creates, we architects are specially interested in the mitigation of the smoke evil, for while it exists buildings are spoilt and colour is non-existent. That "grand, elemental passion of mankind for noble building" is rendered languid and inoperative. What is the remedy for the present state of affairs, and how long will it take that remedy to work its cure? Some people will tell you it can be cured by legislation, and the late Chairman of the West Riding County Council once advanced the delightful suggestion that all offending manufacturers should be obliged by law to reside for six months of the year next door to their works—and on the leeward side. But legislation has a habit of not curing the evils which it was framed to cure. The best remedy would seem to lie in the growing use of electric power; and those who are fostering this extension of electric power are doing a real service to the community. It is on its universal application to industry that many far-seeing men base their hopes for better atmospheric conditions in our manufacturing towns. The growth of a

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healthy public opinion is also doing something already. It is not necessary to abuse people or to irritate the average man by preaching at him in order to make him see that the West Riding of Yorkshire would be a more cheerful place to live in if the smoke nuisance were removed. For, happily, the arguments of the old "muck means money" school are not now regarded as being either humorous or even approximately true. There are too many examples in our midst of debilitated and joyless humanity, of stunted vegetation, and disfigured buildings to allow of the matter being treated in any but the most serious spirit.

Under better atmospheric conditions it would be a joy to people to live, instead of, as is too often the case at present, merely existing, or seizing the pardonable opportunity, whenever it offers itself, to fly from the smoke and build elsewhere the houses of their choice.

There are many ways in which members of our Society can train themselves to think of the best means by which our city can develop itself on methodical, orderly and coherent lines—the study of plans, contours, traffic and tram routes; the tendency of the population to migrate towards certain localities; the suitability of certain districts for factories and works, and all the thousand and one items of local knowledge which go towards the making of a thorough understanding of the problems involved. Then, with the training of an architect at your back, you are in a better position than a member of any other profession to evolve orderly and dignified suggestions for your city's improvement.

There can be no better exercise for the architectural student than essays of this kind, no better employment for the leisure of the older architect. I wish the Corporation could be persuaded to inaugurate, say, two competitions, one for the best design for improving the central area of Leeds, the other for the lay-out and correlation of the suburbs. It would be money well spent, and the prize designs would form a basis upon which future improvements could be carried out.

The Royal Institute wisely seized upon a time when the imagination of the whole of Europe is alive to the matter of town planning to hold their International Congress, and the success of that Congress is now a matter of history. Moreover, the Royal Academy made the unexampled concession of opening its doors to an exhibition of plans, drawings and models illustrative of the art of laying-out cities.

All this is to the good. It demands of architects a wider vision, a larger field of achievement. But it is as well to remember that detail must not be forgotten in the newer outlook. The almost passionate study of detail during the Gothic revival led to the renewed interest in craftsmanship and to the due appreciation of the importance of material and texture in building which is becoming more in evidence every day. We owe a great debt of gratitude to the Gothic revival, and the lessons learnt from it must not be forgotten if we are to take our place as leaders in the larger schemes of corporate planning and co-operative development which are in the air to-day.

So far as Leeds itself is concerned, it seems probable that for some little time to come the Town Planning Act will not be called into operation. Our committee will, perforce, have to hold a watching brief. There will thus be ample opportunity when the time comes, as come it must, for the production of a suitable scheme, and to profit by the experiments which will have been made in other places.

The Corporation of Leeds have in the past been acting while others have been talking, and the new York Road is a fine monument to the unselfish and untiring work of the Development Committee, whose chairman we are proud to possess as a member of the Council of our Society. Much work yet remains to be done by that committee, and until that is accomplished it is unlikely that they will turn their minds to other problems. For it must be remembered that town planning costs money, and it is impossible that it should be otherwise, since the essence of town planning consists in the restriction of the number of houses per acre. Wise forethought and a wider outlook for the future are particularly necessary in the growing suburbs, and it is here that individual developers would in most cases gladly accept guidance, if only for their own protection.

But in any case let us congratulate ourselves that the town planning idea has become popular, for its indirect influence upon architecture and architects is bound to be immense. It has already caused the public to obtain a larger grasp of the real inwardness of architecture, and to look upon it less as a matter of specimen details.

Half a century ago the Gothic revival was the motive force in architecture; the intimate study of detail was urged upon the student as his highest duty. Ruskin had published in 1851 his "Stones of Venice," dealing with the capitals, the columns, the panels—not the buildings of Venice, much less the grouping of one building with another.

The public mind has, however, been prepared by this study of detail to appreciate the wider aspect of the essential qualities of architecture, such as breadth, refinement and scale. It has begun to see that an ornamented building is not always necessarily a "handsome" building, or an unornamented one always necessarily an ugly one. The public mind has also come to see that the right grouping of buildings is of elemental importance. The great strides made by photography in recent years in the adequate portrayal of buildings, and the well-chosen and beautifully illustrated examples of old houses published by such papers as *Country Life* have also had a great influence on public taste. The more human and rational theory of the development of historic styles in building has also done much towards the popularisation of the study of architecture. In the old days, when different styles were divided up into separate compartments like specimens in a museum, architecture was regarded as a kind of occult science to be avoided by the average person, who would have been glad to have known more about the house in which he lived, or the church in which he worshipped, had that knowledge been made reasonably simple for him. Now that the principle of evolution has been applied to the history of architecture the tangle has unravelled itself, and the story is as simple as it is fascinating to the lay mind.

The public are therefore in a better position than formerly to appreciate good building and to demand it from architects. Let us see to it that the supply is more than equal to the demand.

Last summer Mr. John Burns, in addressing some local authority, made use of the following words: "The more money you spend upon architects, the less you will have to spend upon the governors of gaols." Gentlemen, I can imagine no truer or more weighty words, no words more in harmony with the sentiments of the members of our Society. I would like to see them written up in letters of gold in every council chamber in the West Riding.

I do not know how much money is being spent at the present time upon governors of gaols, but certainly not very much is being spent locally on architects. If the building trade has lifted itself slightly from the abyss into which it sank some years ago, there are many influences still at work to retard its upward progress. But I believe these influences are only temporary, and I have confidence that matters will right themselves in time.

The building industry has been passing through a crisis in this country such as can only be compared with the three great waves of depression which have happened in our history, and they were all consequent upon political action. The first occurred in Henry VIII.'s reign, after the dissolution of the monasteries and the consequent uncertainty of tenure in property. The second was caused by the Civil War in the middle of the seventeenth century; and the third was in the earlier years of the nineteenth century, as a result of the exhaustion which followed the wars with France and of the political agitation which accompanied the Reform Bill. Yet in every case there followed a period of security, when the building trade flourished and political agitation was dormant. After the dissolution of the monasteries came the age of Elizabeth, with its splendid building achievements. After the Civil War came the age of Sir Christopher Wren. The latter part of the nineteenth century was a time of almost feverish building activity. The recent depression has undoubtedly been caused by the exhaustion of the country consequent upon the South African war, and by the far-reaching and unsettling Acts of Parliament concerning property to which we have within the last few years been witnesses, but the effects of which no man can so far foresee.

There is a local story of two manufacturers who met at dinner in one of the blackest years of "the hungry 'forties," and after the third bottle of "the archbishop's port," one of them rose from the table and, slapping his thigh, said emphatically, "Whatever the outlook, I believe in Old England yet." The marvellous industrial renaissance, in which Leeds has had so large a share, began shortly afterwards.

There are signs that the coming democracy will be intelligent and generous patrons of architecture, and that they will take their place, like the Church in the Middle Ages, as promoters and directors of a sane and prolific school of

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building. After the collapse of the Church at the Reformation, the aristocracy took its place as the patron of architecture, and proved to be a comprehensive, if selfish, employer. The Plutocracy which succeeded was both ignorant and indifferent, and its patronage of architecture must, speaking broadly, be pronounced a failure. Let us look forward, therefore, to a period of rest from political agitation, and, consequently, to a period of security, when the democracy can work out its dreams for better housing and noble civic planning: to a period, in fact, when all the money shall be paid to architects and none to the governors of gaols.

There is a matter of great importance for the furtherance of which I would urge you all, on behalf of the Royal Institute, to use your best endeavours with any of your friends to whom the case may be applicable. The admission of members of the newly created section of Licentiates at the Institute only remains open until March next. The Institute is making a businesslike and strenuous effort to include all *bona-fide* practitioners and assistants of experience within its ranks. It is to the interest of this Society, whose members are practically solid for statutory registration, to assist the Institute in every way it can in this matter. For, with its hands strengthened by the inclusion of these new members, the Institute can go forward with a coherent authority at its back to demand legal recognition for architects. Unless this demand is practically unanimous it is not likely that Parliament will accede to it.

Finally, I should like to offer, with very great diffidence, a few words of advice to our younger men and students. There exists at present amongst the younger members of our Society a seriousness of purpose and a standard of design which is worthy of all praise. I believe that in the future these qualities will bear good fruit for the benefit of the city. Whilst the energies of the nineteenth century were devoted to purely utilitarian progress, to sanitation, to water supply, to quick transit, and suchlike, now something more is demanded: some sense of dignity, orderliness, and civic beauty. It is to the architects that people will look to supply these qualities. Your equipment, therefore, must be comprehensive and your training thorough. The opportunities offered by the Leeds Education Committee at the School of Art are excellent. Take every advantage of them.

Refuse to be influenced by every passing architectural fashion. It takes a lifetime thoroughly to master any one style of architecture, and since our modern architecture, like all the building of the past, must be based upon tradition, study and absorb the spirit of the work of the past. Choose out some particular phase of it, and make yourself a master of that phase; so that when you are designing a building the setting will come as readily to your pencil as your native language comes to your lips when there is occasion for speech.

The buildings designed by men out of the fulness of their knowledge are the buildings which give the highest pleasure, and which will live by reason of their unconscious originality.

While we are on this subject of design I should like to ask you to avoid the sweeping condemnation of work by other men, which one sometimes hears from those who often have not taken the trouble thoroughly to study the condemned design, much less the conditions under which it was produced.

The words of Bishop Creighton with regard to morals are applicable also to the kindred quality of design. "Very frequently," he said, "the bad people are not so bad as the good people think they are, and sometimes the good people are not so good as they think themselves to be."

One warning let me give you from practical experience, a warning especially necessary to those who have to work for a public who love cheapness for its own sake. Don't try and make your buildings too cheap. As a great architect of the last century used to say, "People soon forget the expense of building, but bad work is always with them, and cheap work is nearly always bad."

And though you may have little in a city like Leeds, with the exception of our noble Town Hall, to stimulate your imagination, still there are whole streets whose buildings seem nothing but silent pleaders to the imperative need of rebuilding. Such monuments may well stimulate your minds to dream of what might be—dreams which, I trust, for the sake of the city, of its inhabitants, and of yourselves, may in the future, and in a less smoke-laden atmosphere, materialise into substantial structures of stone or brick—or ferro-concrete.

A cordial vote of thanks, on a motion of Mr. W. H. Thorp, F.R.I.B.A., seconded by Mr. H. S. Chorley, F.R.I.B.A., was accorded Mr. Kitson by an interested gathering of members and friends, and the proceedings terminated in an enjoyable smoking concert.

In the course of the evening the prizes won in the Society's competitions were presented to the successful students.

The next meeting will be held at the Society's room in the Leeds Institute, on Thursday, November 24, when Mr. Arthur Marshall, A.R.I.B.A., will read a paper on "Spanish Places and People."

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 38, MR. G. H. GRAYSON, M.A., A.R.I.B.A NO. 39, MR. ARTHUR KEEN, F.R.I.B.A.

THESE architects may be considered as typical exponents of modern domestic architecture, Mr. GRAYSON in the North and Mr. KEEN in the South. Mr. KEEN is also at the present time the President of the Architectural Association.

HOUSE AT HIGHGATE, N.

THIS house is now being built. It is faced with mottled red bricks and roofed with Burgess Hill tiles. The builder is Mr. Henry BROWN, of Paddington; the glazing and casements are by Messrs. W. MORRIS & Co., and the architect is Mr. ARTHUR KEEN.

BAPTIST CHURCH HOUSE, SOUTHAMPTON ROW, W.C.—THE LIBRARY.

THIS building was erected a few years ago in Southampton Row, London. It contains, in addition to a considerable amount of office accommodation, a publication department, Council chamber, committee rooms, and the large library shown in our illustration. This room is lighted on both sides, and general joinery work and bookcases, &c., are in oak. The plaster work was modelled by Mr. LAURENCE A. TURNER; the builders were Messrs. HIGGS & HILL, and the architect Mr. ARTHUR KEEN.

LONDON AND PROVINCIAL BANK, STAMFORD HILL, N.

THESE commanding premises have lately been erected for the London and Provincial Bank, Ltd. They contain on the ground floor a large banking hall, manager's office, and strong room. A side entrance is provided for the manager, which leads to his residence on the upper floors. The banking hall is heated by hot-water radiators from a heating chamber in the basement, provided with a small gas generator. The heating system was installed by Messrs. RAWLINGS BROS., Ltd. The stonework to main entrance and banking hall windows has been executed in Portland stone from the Whitbed by Messrs. BYSOUTH, who also executed the carving to the stonework. The mahogany fittings and screen were carried out by Messrs. BURKLE & Co. The mosaic to the banking hall and entrance was executed by Messrs. RUST. The general contractors were Messrs. EDMONDSON, Ltd., and the architects for the bank were Messrs. BANISTER FLETCHER & SONS.

DETAIL OF FRONT, WILLIAMS DEACON'S BANK, LTD., CHEAPSIDE BRANCH.

THE ground floor is occupied by a branch of Messrs. WILLIAMS DEACON'S Bank, Ltd., and although built at the same time was designed and carried out under separate supervision, Mr. HENRY TANNER, F.R.I.B.A., being the architect for the bank. There are two entrances, one to the bank, the other to the offices above, and these and the plinth are executed in Cornish grey granite. The circular-headed window between has a gunmetal casement, the screen being specially designed, embodying the crest of the bank. The only carved ornament is the double-headed eagle over the entrance to ground floor and the brackets in the fascia, which take the form of a string of coins which, with the above-mentioned features, clearly indicate the purpose of this portion of the building. Messrs. TROLLOPE, SONS, and COLLS & SONS were the contractors. Messrs. RAMSAY & Co. and Messrs. SINGER & SONS executed the metal screen and window. The carving was executed by Mr. J. A. STEVENSON, of St. Oswald's Studios, West Brompton, S.W., and Messrs. HIGGINS & GRIFFITHS were responsible for the electric light work and the various metal fittings.

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LIVING ARCHITECTS. No. 38: MR. G. H. GRAYSON, M.A., A.R.I.B.A.

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LIVING ARCHITECTS. No. 39: MR. ARTHUR KEEN, F.R.I.B.A.

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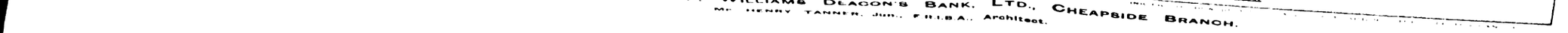
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Detail of Front: Williams Deacon's Bank, Ltd., Cheapside Branch.

Mr. Henry Tanner, Jun., F.R.I.B.A., Architect.

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Mr. ARTHUR KEEN, F.R.I.B.A., Architect.

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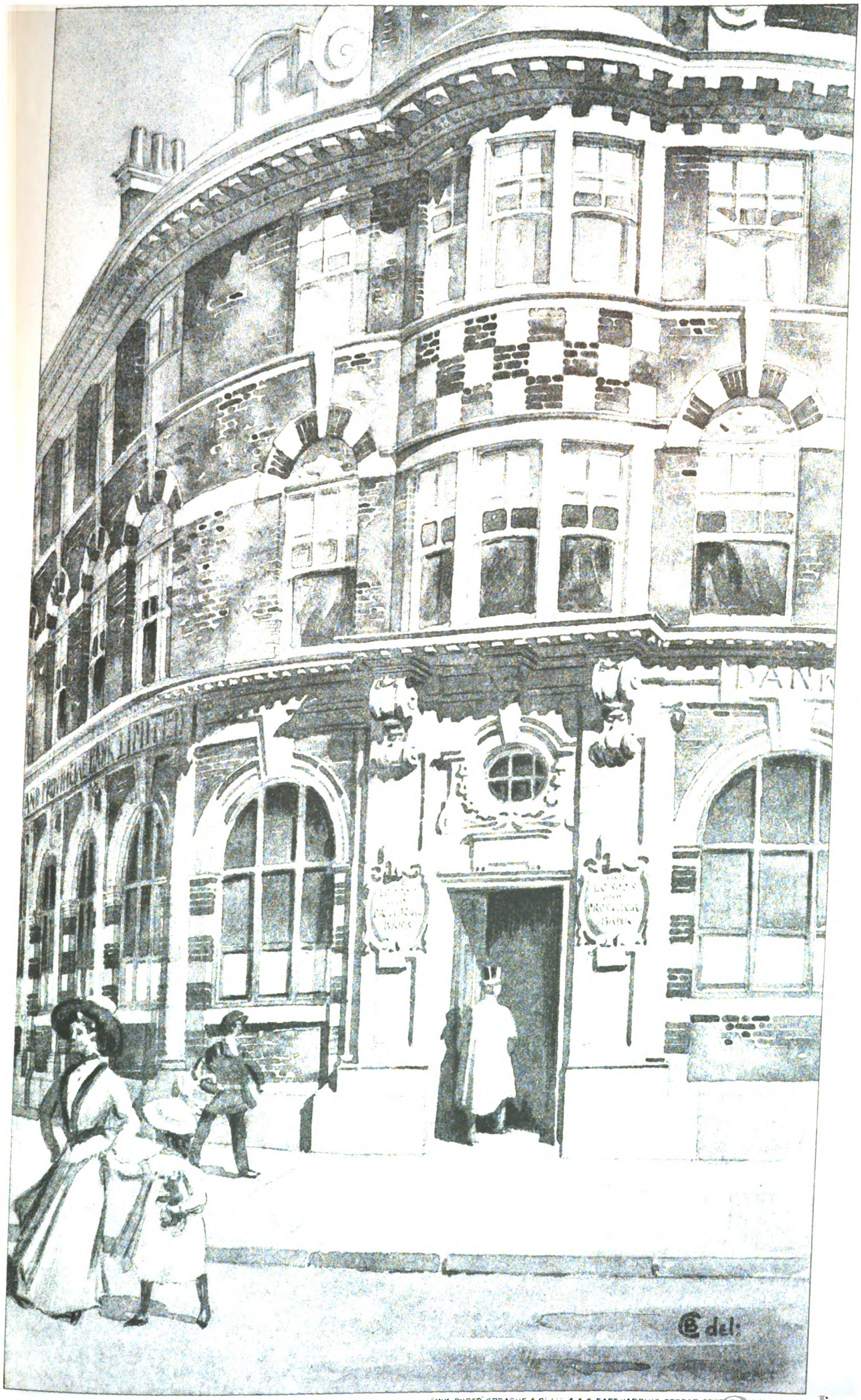
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HOUSE AT HIGHGATE, N.

Mr. ARTHUR KEEN, F.R.I.B.A., Architect.

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LONDON AND PROVINCIAL BANK, STAMFORD HILL, N.

BANISTER FLETCHER & SONS, Architects.

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PETROL AIR-GAS.

THEORY AND PRACTICE OF THE NEW ILLUMINANT.

By Professor C. A. M. Smith, M.Sc.

(*Continued from page* 299.)

Air-gas Systems.

THESE are divided, as previously stated, into three classes, which are here dealt with more fully.*

Saturated Systems (practically obsolete).

"*Faignot*" *Apparatus.*—This was a direct development of the "gas fountain," except that a current of air was forced through the carburettor by means of a pump driven by falling weights. The carburettor contained wicks or rolls of cotton standing in spirit, also deflecting screens. One run of the weights generally sufficed for six to twelve hours. The objection to this and all similar systems is that there are no arrangements for ensuring a constant mixture.

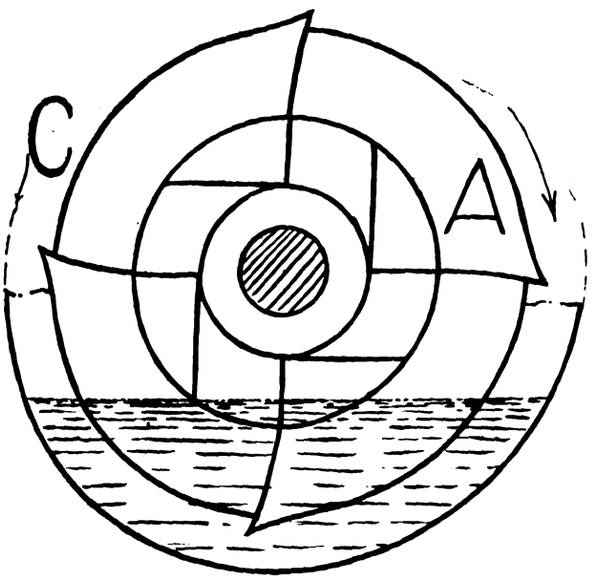


FIG. 7.

"*La Luciole*" *Apparatus.*—Similar to the Faignot, but the carburettor is fitted with trays, over which the petrol passes from a supply vessel. The latter has a supply tube dipping slightly below the level of the liquid. When the pipe is uncovered a fresh supply of air enters and forces the liquid to rise. Thus the supply is kept constant. One run of the weights suffices for eight hours, and one gallon of spirit supplies 315 cubic feet of gas.

Müller's Apparatus was also similar to the Faignot. The general name was the "Alpha" gas-making machine. The gas made by this machine was of about the same quality as coal-gas, a burner consuming 5 cubic feet per hour (Argand) giving 16 candle-power. To produce gas of this quality one gallon was used for about 400 cubic feet. At 10*d.* per gallon for petrol 1,000 cubic feet of gas costs 2*s.* 1*d.*

Van Vriesland System.—The original plant is shown in diagrammatic outline in fig. 7. A consists of four rectangular section tubes wound in spiral form round a central axis. A side view of these is also shown. The spiral is mounted on a revolving spindle, B, driven by a pulley, D, and rotates inside a circular drum, C. The latter is partly filled with petrol. As the spiral revolves it picks up petrol and churns it up with air, and finally forces both petrol and the air (now saturated with vapour) into the chamber E. The excess spirit passes back to the chamber C by means of a connection, G, while the gas passes out at the pipe H. The same action as propels the gas forward sucks in air at F. When the gas is turned off the vapour simply bubbles through at G. The gas is, of course, quite saturated, one gallon of spirit making only 120 to 240 cubic feet of gas, according to the temperature. The motive power is provided by a small hot-air engine driven by some of the gas made in the apparatus. Such an arrangement will, of course, suffer from all the disadvantages of the saturated systems—condensation in the pipes, possibility of explosions, &c. Otherwise it is a very simple but efficient apparatus, and at one time, with certain modifications to that illustrated in fig. 7, was largely used on the continent of Europe.

The "Doseur Guy" Apparatus worked on the same general principle as the Van Vriesland, except that the chamber filled with petrol in the latter machine was replaced by one containing water. The petrol was supplied to this chamber in measured quantities by means of a kind of rotating cock, having chambers the volume of which could be adjusted. The petrol floated on the surface of the water, and was churned up and vaporised similar to the modern "Centenary" plant to be described later. This was a semi-saturated system, making approximately 480 cubic feet of gas per gallon of spirit and having a calorific value of 292 B.Th.U. per cubic foot.

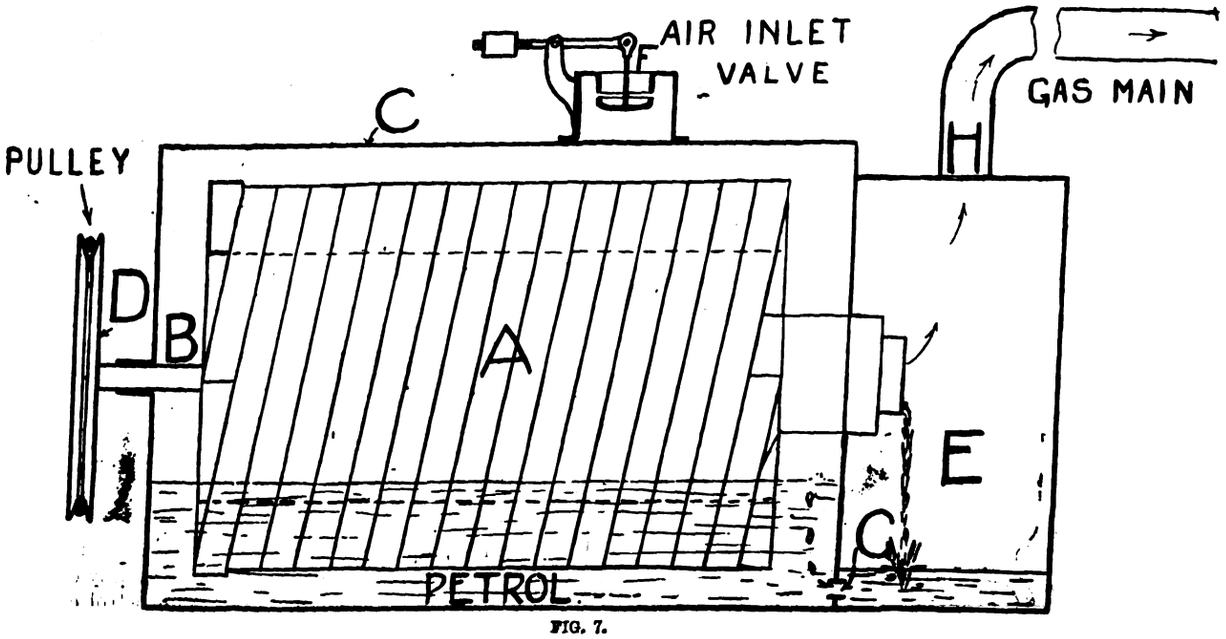


FIG. 7.

Hearson's "Sun" Gas-making Plant depended on a similar principle to the Van Vriesland, but here falling weights were used as motive power.

The "Fischer Light" employed heavy spirits, such as benzol (either refined or crude). The apparatus con-

* The descriptions of all except the more important systems at present in use are intended only to be notes.

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sisted of a hot-air engine driving an air blower, which forced the air through a heater before it entered the carburettor. The latter contained a constant quantity of spirit, which is replaced proportionally to the gas consumption. According to MM. GALINE and ST. PAUL, as much as 206 candle-power hours (decimal standard) have been obtained on this apparatus with a consumption of 33.8 grammes of benzol. This is equivalent to 24,600 candle-power hours per gallon of spirit, a figure probably much exaggerated.

Coming now to the dilute mixtures only suitable for use with incandescent burners, we have, amongst many others, the following plants:—

The "Centenary" Plant.—This is illustrated in diagrammatic outline in fig. 8. The apparatus consists of a cylindrical drum, A, divided into two compartments by a diaphragm, B. The compartment C contains petrol, while the compartment D contains water. Revolving in D is

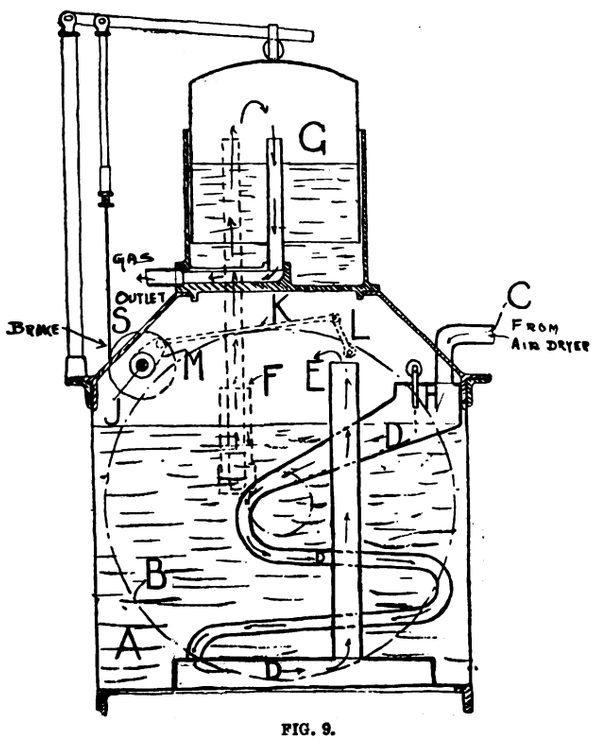


FIG. 9.

an arrangement which will be recognised as a kind of reversed wet gas-meter. The section of this is shown in the side elevation. This contrivance is attached to a spindle passing outside the apparatus and driven by a hot-air engine connected by a belt to the pulley shown. Looking at the section, it will be seen that as the drum revolves the chamber E fills with air, while the contents of F are forced into the central chamber G, and from thence into the outlet pipe at H. The chamber G contains the petrol supply, and revolving in it are a number of cups, such as J, J', which pick up the petrol and deposit it into a receptacle at K, whence it passes by way of a regulating valve into the chamber D and floats on the surface of the water. As the drum revolves it agitates the air and petrol

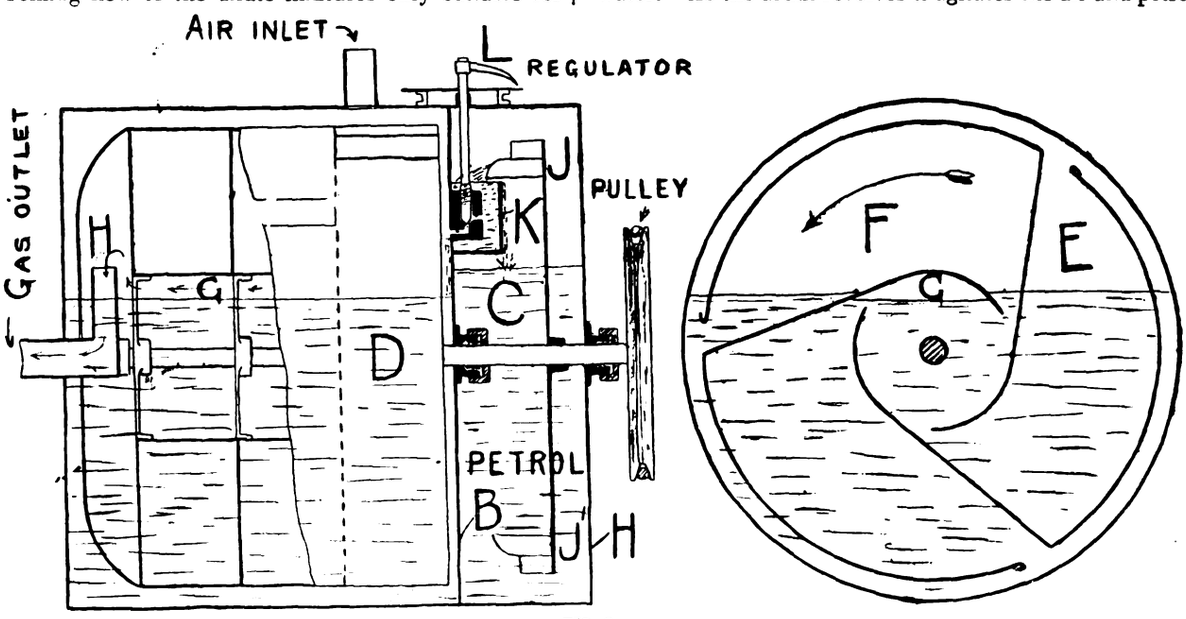


FIG. 8.

together, vaporises the latter, and thus generates the air-gas. The gas passes into a "gasometer" or bell. When this rises to the top of its lift a trip gear throws over the belt driving the machine on to a loose pulley, and by means of another cock (not shown) shuts off the supply of petrol escaping from the receptacle K. The exact mixture is regulated according to circumstances by means of the cock L, the handle of which moves over a graduated dial.

The "Safety Light" Apparatus.—This is illustrated in outline by figs. 9 and 10. There is a chamber, A, in the base of the machine, in which revolves a drum, B, similar in principle to that described in the "Centenary" plant. This sucks in air at C, which has previously passed

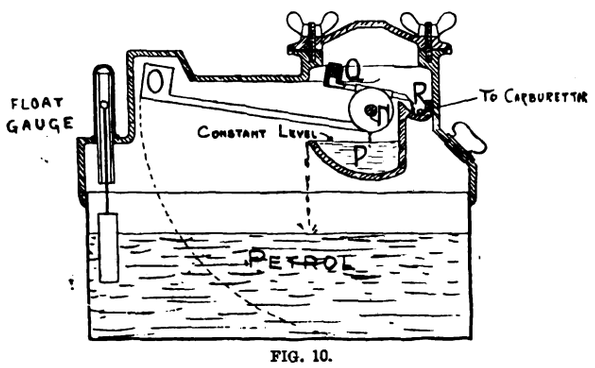


FIG. 10.

through a calcium chloride drying chamber, draws it down through D, up from the outlet at E, and, after passing through the revolving drum, forces it by way of the outlet pipe F up into the gas-bell G. The petrol enters at H and runs down the long, winding carburettor and is evaporated by the air which is passing over it. Geared to the main driving spindle is a secondary shaft, J, which, by means of the crank M and link K, oscillates the lever L. Referring to fig. 10, the latter is connected to a spindle, N. As this oscillates backwards and forwards the cup O picks up petrol, which runs down the arm

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(which is hollow) into the receptacle P. There being an excessive supply to this latter, the level always remains at the overflow. A second adjustable scoop, Q, in like manner picks up the petrol from P, which, being kept at constant level, always allows a definite quantity to be picked up per stroke, and deposits it into the small receptacle R, from which it runs into the pipe H out into the carburettor in the manner previously described. When the supply of gas has lifted the gas-bell to its top limit a system of levers (shown in fig. 9) applies a band brake at S and stops any further working. The motive power is provided by falling weights or by means of a water displacer.

(To be continued in our issue of December 2.)

THE L.C.C. AND DISTRICT SURVEYORS.

AT the sitting of the London County Council on Tuesday the following appointments were made to the vacant offices of district inspectors:—Battersea Central, Mr. Percy John Black; Bromley St. Leonard, Mr. R. H. J. Mayhew; Deptford, Mr. B. Greig; North Kensington, Mr. G. Tolley; South Kensington, Mr. R. D. Hansom; Rotherhithe, Mr. C A. Daubney; East Streatham, Mr. A. G. Morrice; East Wandsworth, Mr. H. T. Bromley; Sydenham, Mr. A. H. Verstage; Catford, Mr. E. A. Young. The gross amounts of the fees received during the year 1909 in respect of the districts during 1909 were respectively 399*l.*, 259*l.*, 522*l.*, 1,124*l.*, 842*l.*, 416*l.*, 660*l.*, 567*l.*, 487*l.*, and 428*l.*

Mr. Ed. Smith drew attention to the differences in the emoluments, and said he still hoped that at some time a scheme would be formulated for the payment of the surveyors by salary.

Considerable discussion took place on a recommendation of the Building Act Committee to suspend the standing orders so that legislation might be promoted next session for amending the London Building Act, 1894, so as to make it clear that the Council's school buildings were exempt from those portions of the Act which required notice to be given to the district surveyors and fees to be paid to them in respect of new buildings, and also to provide that the fees payable to district surveyors in respect of additions to, or alterations or other works in, completed buildings shall be based in the case of additions on the area and height of the addition, including therein such portions of the building as may be structurally affected by the addition, and in the case of alterations on the area and height of the portion of the building structurally affected.

As the motion for suspension was defeated, it will be too late to give the necessary Parliamentary notices for next session.

MANCHESTER SOCIETY OF ARCHITECTS.

ON Wednesday, November 9, at a sessional papers' meeting of the Society, Mr. Herbert L. North, B.A., read a paper on "Some Aspects of the English Tradition in Building." Tradition in building, Mr. North said, was the accumulation of experience in producing a balance between the purpose of the building, the time or money expended upon it, and the nature of the materials used. So there is an unbroken line of advance from the primitive wattle buildings of our ancestors to Westminster Abbey or the well-nigh perfect stone cottages of the Cotswolds. Architecture in the Middle Ages, as the literature of the period shows, exerted much greater influence than to-day. He asked: "How was it that the public care so little about architecture?" Was it not because the chain of tradition was broken, and the foreign craftsmen and the paper architect have grafted on an exotic branch which has borne bitter fruit? The Renaissance was at first a stimulating influence, but when the great lights had departed it became more pompous and pedantic, and, the greatest sin of all, it killed the English love of colour.

Then there was the paper architect. Architecture has become an individual matter, not a matter of almost national universality; and this, he suggested, was why we had lost the public interest. We have one fashion after another. In the course of one generation we have gone through the whole architectural gamut. How great a force we should be if our work sprang from our English traditional tree, if we worked on the same practical and truthful system again, a system of infinite elasticity with the widest scope for genius.

Coming to practical points, Mr. North thought that as reinforced concrete took the place of older material some new treatment would be required, but for smaller buildings in the country he advocated traditional materials and methods. He instanced several aspects of the treatment of roofs, dormers, partitions, ceilings, &c. Old roofs were generally about 20 feet span; dormers were placed at least half-way up the slope. The most successful pitches were 50° to 55°, and where a roof was continued downwards at a smaller pitch the lengths of the two sections should be approximately equal. The traditional treatment of partitions, stud and panel or stud and plaster, were little more expensive than the Georgian lath-and-plaster partition, and far more desirable; and the old beamed ceilings were much more interesting than an expanse of white plaster. Touching church work, the best point at which we should take up tradition was the thirteenth century. Later styles had less possibility of expansion.

Several members took part in the discussion which followed. Mr. Phil. Parker spoke of Mr. North's work, and thought it always looked at home with the English landscape. The President, Mr. P. S. Worthington, thought that tradition served its most useful purpose when we had in our study steeped ourselves in it and it became part of us and came out naturally in our work, rather than when traditional features or methods were definitely copied. He regarded the Renaissance as the natural outcome of the life of the period.

COMPETITION FOR NEW MUNICIPAL BUILDINGS, COVENTRY.

IN accordance with a resolution of the City Council, conditions and instructions have been issued to architects who desire to compete in preparing designs for the municipal buildings and the proposed town hall at Coventry. The Council invite designs and estimates for municipal offices and town hall as one scheme, but the town hall portion may or may not be proceeded with. Competitors are advised, therefore, that it is desirable to design the municipal offices so that they can be erected and completed independently of the town hall, but with the ultimate idea of forming one building.

Explicit details are given as to the requirements, and it is stated that the cost of the municipal buildings is not to exceed 50,000*l.*, but the cost of the town hall is left to the discretion of the competitors. The designs are to be anonymously sent in, and will be submitted to the assessor, Mr. E. Guy Dawber, F.R.I.B.A., who will advise the Council which is, in his opinion, the one most suitable for adoption. The author of the design placed first by the assessor will be employed to carry out the work in so far as the municipal offices are concerned unless the Council should be satisfied that there is some valid objection to his employment. In that case the author of the design placed second will be employed, and in that case the premium of 175*l.* will be paid to the architect whose design was originally selected. The architect appointed to cary out the work will be paid 150*l.* in addition to any commission he may be entitled to in connection with the municipal offices, and the payment of this sum will relieve the Council of any further liability in connection with the design for the town hall. The author of the design placed second, subject to the above conditions, will be paid a premium of 175*l.*, and the author of the third design 175*l.* Details of the percentage on construction are added, and it is stipulated that the premiated plans will become the property of the Council.

Seventy-six rooms are to be provided with lavatories and telephone accommodation for all the departments, and a caretaker's residence and a lift for passengers. On the first floor accommodation will be required for a Council Chamber for, say, sixty members and officials, two committee rooms, an ante-room, a cloak room, lavatories, &c., Mayor's parlour, and another ante-room, with a public gallery in the Council room, and a separate approach for the public.

The town hall is designed to seat 1,200 on the ground floor, with galleries to seat another 300, more or less, as found possible. Proper reception and ante rooms, with cloak rooms and lavatory accommodation for both sexes, must be provided; also dressing and retiring rooms from the platform, storage below the hall for chairs, and caretaker's residence, with separate entrance from St. Mary's Hall side. The heating and lighting can be arranged separately from the municipal offices. Designs have to be sent in by March 1, 1911.

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COMPETITION NEWS.

AIRDRIE.—The committee appointed to carry out the erection of a town hall for Airdrie with the 10,000*l.* provided by Sir John Wilson, Bart., has now considered the report by the adjudicator on the five sets of plans submitted to him, and which he had placed in the following order:—1, Plan No. 1; 2, Plan No. 4; 3, Plan No. 3. On the sealed envelopes being opened, it was ascertained that the first was that of Messrs. James Thomson & Sons, Airdrie; the second that of Messrs. George Arthur & Son, Airdrie; and the third that of Mr. A. Danskin Aitken, Airdrie. The committee unanimously agreed that the plan placed first should be adopted, and Messrs. Thomson were appointed the architects of the new building.

ENGLISH DOMESTIC WORK.—III.

THE third of the course of eight public lectures by Mr. J. A. Gotch, F.S.A., F.R.I.B.A., at University College, Gower Street, W.C., on the above subject dealt with

The Coming of the Italian Influence.

Architecture, in common with all other things that come under the observation of mankind, said Mr. Gotch, shows a tendency to change. No sooner have a set of forms become established and been carried towards perfection than they are supplanted by another, which in their turn linger just long enough to imprint their character upon the period. In England this process continued uninterruptedly for four or five centuries—from the time when we may be first said to have possessed a national architecture down to the end of the fifteenth century. Each new growth sprang from something that was already there. The stern outlines and detail of the Norman barons gradually softened, the round arch gave way to the pointed, and the pointed arch became flattened from the acute to the obtuse.

The last phase of English Gothic architecture before it became tinged with foreign detail presents many fine and interesting examples. Many of the Tudor houses, such as Kirkby Muxloe, Compton Winyates, and Fawsley Dower House, were built of brick, with most of the wrought work in stone. The windows were still small, though fairly numerous; their arches, as well as those of the doorways, were flat pointed. The chimneys assumed an amazing richness, whether in stone or brick, Tudor chimneys being, indeed, one of the most remarkable productions of English craftsmen. The twisted stalks which characterise some of the chimneys were also adopted in stone finials. A typical example is Clifton Maybank, Dorset, with a characteristic oriel high above the ground, octagonal pilasters in the front, and steep gables. But there is a feeling about the whole Gothic treatment which seems to prepare for the advent of Renaissance detail.

With the accession of Henry VIII. the conditions governing architectural detail underwent an alteration: there came an outside influence to affect English developments, and certain forms and features crept in which had their origin in sunny Italy. Though in course of time they ousted the natives from their fastnesses, at first their foothold was somewhat precarious, for they only affected a lodgment here and there, in this feature and in that. The struggle went on through the whole of the sixteenth century and well into the seventeenth. At length, under the leadership of Inigo Jones, the invaders finally triumphed, but during the progress of the strife most piquant effects resulted. Elizabethan architecture, although it has been branded with many hard names, is one of the most interesting phases of the art which England can show, and if tainted with being of doubtful descent, yet, like Faulconbridge in "King John," it may boast of more vigour than if it had been truly bred.

By the end of the fifteenth century all conscious connection between Gothic and its parent, Classic, had long ceased, and the workers on Gothic buildings had no notion that there was any other way than their own of dealing with a building and of embellishing it with ornament. In many respects Gothic had become the antithesis of Classic; all its features were far more ductile. For instance, there is a large range of variety in the acuteness or otherwise of a pointed arch; there is but one form of a semicircular arch. Or, again, the Classic column is the slave of proportion; its limit of variation is strictly defined, but the Gothic pillar may soar to any height. The same thing is witnessed in the horizontal features.

Italy had always been the home of the Classic architecture, and Gothic forms had hardly penetrated into the peninsula. The efforts of the great architects at the Renaissance would probably have taken a Classic direction, no matter what was its cause. But the whole tendency of the force which awoke them was to revive ancient learning, to present ancient ideas in new forms. Particularly was this the case with the ornament, into which was thrown all the delicate fancy, the exquisite drawing, and the perfect execution which distinguish the work of the Renaissance in Italy. Unlike the main lines of the revived Classic, this ornament was as ductile and as mobile as anything which Gothic design could show. Indeed, in this pliability was found the common ground between the two styles, the ground from which the new, strange forms started on their subjugation of the old, familiar features of English Gothic.

Many of the masterpieces of the Renaissance in Italy were well advanced before English work could show the slightest trace of Italian influence. The Pitti Palace at Florence and the Palazzo Riccardi were over eighty years old: the Giant's Staircase in the Doge's Palace at Venice had been built nearly half a century before Englishmen knew of any school of design other than their own, or, at any rate, before they had adopted any but the traditional methods of decoration. It was Henry VIII. who bridged the channel for its passage. He was a brilliant young monarch, bent upon making the English Court as splendid as any in Europe. His rival, Francis of France, had procured great Italian artists to adorn his palaces; Henry must do no less. Invitations were conveyed; but England was far off, and had not yet imbibed the atmosphere of the Renaissance, which was the breath of their nostrils to the masters of the South. Consequently the response was cold, and but few Italians of anything like the first rank found their way over. The greatest among these was Torrigiano, who stayed a few years, during which time he designed three or four tombs. He was followed by a few more Italians of great skill. But in most cases to the Italian names no Italian work can be attached, and to the Italian work no Italian names. A great deal of Italian-looking work was certainly done by Englishmen, for it is erroneous to suppose that all beautiful work must have been produced by foreign craftsmen. It was not in the disposition of the work, but solely in the ornament, that the first touches of Italian influence showed itself in English work. Thus the choir stalls of Christchurch, Hants, have Gothic cresting with Italian pinnacles, and the carved work at the top of the panels is also Italian in feeling. A bench-end in the same church shows the customary motionless and elderly angels replaced by *amorini* in motion, recalling the mid-fifteenth-century tomb in Santa Croce, Florence. The porch at Deene is similar in treatment to a door in Genoa, and precisely the same influence is shown on a wooden door at Compton Winyates.

The entrance to Wolsey's Hampton Court was erected about 1514. It is all Gothic, unless one excepts the slight touch of Italian in the arms over the gateway. The two roundells are actually Italian, and were the work of Giovanni da Maiano, who executed ten of them altogether. Hampton Court includes several interesting ceilings. On Wolsey's fall, in 1530, Henry VIII. took possession of the palace and enlarged it. He rebuilt the Great Hall and put up a roof which is one of the finest pieces of timber work in the country. This roof is thoroughly Gothic in conception and in much of its detail, though much of the latter is finished after the Italian manner. The work was done by English workmen, as is clearly shown by the detailed accounts. The hall door (probably 1530-31) is Gothic with Italian spandrils.

The panelling in the hall of Magdalen College, Oxford, is of special interest because of the fact that the accounts still remain in the Liber Computi of the College for the year 1541. The wainscot was bought in London. Paulyn sawed it up; John Carver provided the glue; Aldrich, White and Hobbs were the masons who provided and prepared the hall. John Hanson provided fifty-two rods of panelling; Henry Bolton and Frost were the two principal joiners employed. Bolton did some of his carving badly, for Frost spent five days in cleaning and putting the last touches on the cresting which the former had unskilfully and coarsely panelled and carved.

The Italianised chimneypiece in Deene Hall, containing the arms of Henry VII., is of uncertain date, but it is possible that it affords the earliest instance of the presence of the Italian influence in England.

Several of the courtiers of Henry VIII. built houses which were strongly touched with the new influence. Some of the owners had been abroad, and, in addition, the great meeting on the Field of the Cloth of Gold may have

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familiarised them with Franco-Italian forms. Layer Marney, Essex (1520-25), has details of pure Classic, though at a distance the building looks like a traditional Gothic tower, with the usual mullions and tracery. But in reality all the superficial ornament is affected by Italian influences. Sutton Place, near Guildford (1523-25), tells a similar story. Other instances are Lacock Abbey, Dingley, and Apethorpe.

While such examples do not comprise quite all that could be mentioned, they serve to show, said Mr. Gotch, how fitful the new fashion was in its appearances. If a blank map of England were taken, and only those places were marked on it which can show any examples of this early phase, it would be only the southern and eastern portions which would have any writing on them. The whole space north of Oxford and west of Cambridge would be practically clean.

GREEK AND ROMAN TOWN PLANNING.

THE Creighton Memorial lecture was delivered at King's College, Strand, on the 11th inst., by Dr. F. J. Haverfield, Litt.D., LL.D., F.B.A., who chose as his subject "Greek and Roman Town Planning." He opened his lecture by saying that Oxford, the University town to which he belonged, has been of late undergoing considerable development; but anyone who walked through the large new suburbs would see that no intelligence had been employed in planning and laying them out. Very recently, however, there had been an improvement, both there and elsewhere. Indeed, the advance made was one of the great advances, in a lesser way, in modern civilisation, for it betokened an advancement in the application of intelligence to the common things in ordinary daily life. In the past, man has refused to put his intelligence into those subjects. During the past few years, however, we have seen that that intelligence is awakening; even though it would seem to be necessary to wait until science points out the dangerous possibilities of an animal like the rat before action is taken.

Town planning, which deals with the ordinary environment of our daily life, has, said Professor Haverfield, taken in the last few weeks a new and vigorous growth. There had been a conference in London, and people were commencing to recognise that if building takes place intelligence must be applied to the task, and that everything should not be left to the builder, or to the architect's somewhat overworked assistant. In fact, town planning has reached the dignity of christening, and ladies now parade it about with a big T and a big P. What, asked Professor Haverfield, was the real justification for town planning being spelt with these capital letters?

First, is there anything further than the application of intelligence? Anyone who attended the town planning conference, or who followed the proceedings, or visited the Exhibition must have noticed that town planning had been employed in a somewhat vague sense. It had been used in many cases merely as a convenient label for the works of an architect who has intelligence enough to advertise his ideas as particularly up to date, so he proclaims that his land is laid out on town-planning principles. He does this because it would be less profitable to say the land had been laid out on his own principles. Perhaps his vagaries may be rather regrettable and serious. Nevertheless, it is described as town planning all the same.

Professor Haverfield said that when he walked through the exhibition at the Royal Academy and looked at the different plans he had been struck by the thought that the world has been planning towns all its days without knowing it. There have been in the past very striking instances of town planning. In our own country there was the work of Wood at Bath in 1735, Grainger at Newcastle in the first half of last century, or James Craig at Edinburgh in 1767. But each of these was the application of the individual intelligence of individual men. By turning to ancient history we, however, arrive at a general conclusion which will take us a little further than the consideration of such isolated efforts.

There are four countries which specially show town planning assuming a definite shape, viz., China, Mesopotamia, Greece, and Rome. In all of them the rectangular street plan was adopted. The rectangle and the straight line are the marks which differentiate man civilised from the barbarian. For proof of this it is only necessary to compare a British and a Roman road. The one wanders anywhere, and only accidentally assumes straightness, while the other is perfectly straight, or, if it bends, it does so on principle. Wherever an intentional straight line or right angle is met with, there civilisation is touched. Up to the present day the rectangle has always been adopted for street planning. The early Chinese towns in Central Asia show that the rectangular pattern was known from great antiquity. When the Chinese conquered parts of Asia Minor they planned their military colonies on that model. How old such a model was, or where it came from, are useless questions. They certainly do not seem to have got it from the western world.

Babylon was an immense town, framed as a square, with streets crossing at right angles. Here was the origin of the later town planning in Greece. In speaking of town planning in Greece it is necessary to pass beyond the great age of that race, for then they do not seem to have brought their intelligence to bear on the subject. This was changed after the great period. The Greeks most probably learnt from Babylon to lay out their town on a rectangular plan. Of Piraeus and Rhodes we can say but little beyond the fact that they seem to have been laid out on a rectangle. A new phase was entered with the expansion of the race under Alexander. Then cities were built wholesale and full grown. In fact, the special feature of the period was that towns were not adapted or reconstructed older settlements, but brand new ones for the disbanded soldiery, who had to be planted somewhere where they would give little trouble. This rapid expansion produced some hundreds of towns, most of which are recognisable by their names. These were all on a definite system of rectangular planning. The most famous was Alexandria, which has been shown to have been built up of a labyrinth of squares and rectangles, seven main lines running east and west, and seven north and south. Excavation of this ancient Greek city is now impossible, by reason of the modern town which covers it. Priene has lately been excavated by the Germans, and the results are extraordinary. Its size was about that of Pompeii. It appears to have been rebuilt in the Macedonian Period.

Roman town planning goes back to the very early days of the history of Italy. In the course of excavations in the Lombardy Plain they have traced little villages made on the plan of the early Italian towns. Palma, for instance, was an enclosure of some thirty acres inside a solid earth rampart. On plan it was a parallelogram, and not a rectangle, and was entered by means of a bridge. Near the crossing of the two principal streets stood a small stadium. But there are existing remains of Italian towns much more characteristic than these doubtful Lombardy villages. These were certainly based on a chess-board plan. Religion may have had something to do with its adoption, though religion was not generally a suggesting force, but one which adopts the stereotyped form. It is abundantly certain that wherever towns were founded in the time of the Republic they were founded on this plan. There were then, as under Alexander, large bodies of discharged soldiers who had to be accommodated somewhere. These emigrants were well organised bodies of men who went out knowing that they were all to live together; and for these a definite plan could be laid down. A typical instance is Timgad, in Roman Africa. Here about A.D. 100, Hadrian founded a town, whose population consisted mainly, if not entirely, of time-expired soldiers with their wives. Its plan has been recovered by French archæologists. The area of thirty or forty acres was divided into small square blocks occupied as private houses. The Forum was like an English market-place for the sale of provisions, with public buildings, shops, temple, and town hall round it; though it differed from those English market places where the main streets converge on the open space. There were baths near it, and a meat market. Timgad grew very rapidly, and it is quite evident that, as it grew, it developed very much on lines like those of a modern town instead of on the rigid system of ancient town planning. The roads outside the old town no longer ran straight. There was also erected a Christian church. Of architectural effects little can be judged. There were certainly one or two arches affording a vista, and there were the street colonnades. But as a rule it is probable that the Romans were rigid economists who counted the cost—a thing which it seems as if people in this country must do too.

Excavations at Lincoln have shown that there were rows of columns lining the principal streets of that Roman town, and there was also a forum as well as a large basilica. As for drainage, there are still the sewers running underneath the four main streets. At Silchester the laying out of the streets was precisely on the chess-board fashion. The houses were really town houses. Cologne has been occupied continually since Roman times, and the remains of the first streets have disappeared, though some of the streets show traces of the original plan. Belgrade is another curious mixture of the ancient and modern: the old town apparently represents the Roman *colonia* with its fortress over-

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MODERN EUROPEAN ARCHITECTURE.

GERMANY.



A COUNTRY HOUSE.—By HERMANN MUTHESIUS, Architect. [From *Dekorative Kunst.*

looking the river. Florence was likewise a Roman settlement. Its Centro, or shopping quarter, is in a regular chess-board manner, with broad streets laid out in a systematic way. This marks a return to its original fashion. An existing map of 1427 shows Florence still unmistakably with its first plan, though in places the streets had become encroached upon, or even blocked. All that the modern architects had to do in Haussmannising the Centro was to widen and straighten out the Roman streets.

Archæological evidence is pretty nearly all that we have to go on with regard to the study of ancient town planning. Literature is entirely silent on the matter, if a few references as to the control of city magistrates are excepted. There is one clause which appears repeatedly in town charters—that no house owner might pull a house down or let it fall save with the consent of the town council, unless he was going to build at least as good a one in its place. The Romans seem to have had a town laid out once for all and then to have left it. All that you get beyond that initial control are such rules as forbade burials or brick-making in a city.

All this is, of course, very different to anything in our own day. But then the problems to be dealt with were so altogether diverse. In the first place, the Romans made no attempt to adapt their old towns; when once they planned a town it was planned *de novo*. In the second place, they had not our problems of distance, for the ordinary area was 100 acres or 200 acres at the outside (except in a few large towns); therefore it was utterly unlike the rectangular problem as applied to Buenos Aires or Chicago. In a Roman town the extra distances necessitated by the rectangular plan made very little difference, as the area was so small; whereas in large modern towns it must be a very serious one. In Khartoum the Union Jack plan has been adopted, and of this he doubted the wisdom. In the ancient world the problem of smoke did not occur, there were no manufactures or chemicals, for it had no science beyond, perhaps, that of medicine. The question of providing "lungs," whether in the form of large parks or small gardens, was also absent. Each Roman house had its own small garden or backyard, possibly with trees in pots. There was no necessity for open spaces like *placès*, crescents, circuses, or squares. There were, of course, a few towns where these open spaces existed. Finally, the artistic problem, and that of the magnificent vista, was very imperfectly solved by Greece or Rome. The Greeks provided magnificent architectural views accompanied by houses which were a disgrace. Nor did the Roman public buildings group in any stately fashion.

The conclusion derived from the study of Greek and Roman town planning would seem to be that modern town planning should break away from the chess-board plan and substitute for it the curve. Whereas in early centuries the straight line was the mark of civilised man, so the curve will be the mark of the civilised man of the future.

Cities should be laid out on a definite plan, though not on that of any individual architect. In England some sort of co-operation was needed, though unfortunately hitherto it has been almost unknown. The philosophy of town plan, as apart from the individual scheme, however brilliant it might be, should be worked out.

Sir ASTON WEBB, C.B., R.A., who took the chair, at the conclusion of Professor Haverfield's lecture made some remarks on the subject. In looking at the lantern views, what had specially struck him, he said, was the fact that ancients seem to have put all their energy into the erection of the public buildings of their town and to have left their own buildings simply. Dr. Haverfield might call this ostentation; another word for it was magnificence. The lecturer had pointed out the disadvantages of the rectangular plan. America also followed the rectangular, and are also finding out the difficulty of it. Chicago and New York are endeavouring to get over the difficulty of having to go round two sides of a rectangle. The extraordinary shapes of buildings which resulted from the awkward sites was exemplified in the Flatiron Building, New York. In many English cities which were laid out by the Romans the original street lines are still visible. Dorchester was one instance. When two or three miles out of the city the traveller realises he is approaching an important place. All must feel that these ancient cities were planned with a view to an artistic result, and the work must have been done by artists or, at any rate, by people who desired to have something fine in their cities. That developed a pride of citizenship. Dr. Haverfield had, unintentionally no doubt, been a little hard on architects in reference to this matter of town planning. The promoters of the Town Planning Conference took a very great deal of

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MODERN EUROPEAN ARCHITECTURE.

GERMANY.



[From *Dekorative Kunst.*

A COUNTRY HOUSE.—By HERMANN MUTHESIUS, Architect.

trouble to get the Exhibition at the Royal Academy together, being animated by a desire to obtain the best information on what was going on all over the world, and not from any personal interest whatever as to what the result might be. What was strongly felt was that in all the improvements which are in progress the artistic side of the matter should not be overlooked, and that it should not be merely a matter of traffic and drains. In London at the present time there were certain matters in which architects were inclined to think that the æsthetic side was in danger of being neglected. Architects asked that this should not be so. If they were to have a great bridge and a great approach from St. Paul's Cathedral, they should be considered together as one great scheme before it was too late to alter it. It seemed to be only common sense that that should be done. They hoped, again, that the King Edward Memorial, whatever form it might finally take, would also help to adorn the metropolis of which their late Sovereign was so proud, and in which he was so much interested. Another much smaller matter, but a very important one, was the question of the exit of the Mall into Charing Cross. How people who were interested in town planning could for a moment suppose that it could remain as it was at present was almost a mystery. There must be a clearance there, and there must be a fine approach made from Trafalgar Square and Charing Cross. London lost a great opportunity when Wren's scheme for rebuilding the metropolis after the great fire was rejected. Unfortunately the citizens would not agree, insisting that their warehouses should be built on precisely the same sites as before. Paris was more fortunate. During the French Revolution the artists of Paris periodically met together and prepared for the improvement of the condition of the people. And most of those suggestions were afterwards adopted by Baron Haussmann. Architects, painters, sculptors, and all who are artistically inclined should combine to ensure that the development of our towns is made on artistic lines.

MR. T. DUNCAN RHIND, A.R.I.B.A., Edinburgh, has prepared plans for the erection of a Territorial drill hall on a site nearly opposite the Post Office, Dalkeith.

AN OLD-WORLD SETTLEMENT.

By JOHN A. RANDOLPH.

ABOUT half-way between Redhill and the "Surrey Paradise" we dealt with recently is another choice Surrey gem, more rich in old and picturesque houses even than Oxted, but most of them in the main thoroughfare; and, what is more satisfactory, there is no railway station nearer than one and a half miles from the nearest village, which is two miles to the west of this old-time settlement. Approaching from that side, the presence of treasures within is not even hinted at, for the houses there are ordinary that are of any greater antiquity than the second quarter of the last century, while those of more recent date are artificial, but are not so vulgarly aggressive (except in the laying-out of their grounds) as the modern excrescences in the outskirts of Surrey towns and the southern and western suburbs of London; nor are the owners bitten much by the craze for Bedlamite names for their abodes. Where the road goes downhill into the village it takes a bend leftwards, and the locality becomes more irregular and quaint, with the houses gradually being set further back, on the left, on a bank with a footway raised above the road-level. Before one can quite realise it one plunges, *in medias res*, in the thick of old timber-framed and lovely gables in a thoroughfare as wide as Oxford Street at its widest part.

Still the church is invisible; and one has to pass almost to the limits of the village before seeing it emerge from behind a delightful little "street" at the rear of a small group of timber-framed houses that face the main road. Opposite this churchyard is a pleasing example of ancient hostelry, which boasts, we were told, of an Elizabethan chimney-piece. The church, now visible for almost its entire length, contains some interesting monuments and some bold fourteenth and fifteenth-century windows in the south aisle before us; and the huge, partly Norman west tower, formerly crowned by a lofty spire, was, when we saw it during this alleged summer, completely skinned of its rough-cast, and a gigantic scaffolding erected all round it up to the top for very urgent repairs, though plans for such work were made ten years ago, according to a framed, measured

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drawing of the west front that hung in the south porch, showing the tower as restored. Apparently, after the renewal of the belfry windows at the top and the repointing of the arches and dressings, the abominable rough-cast is again to be laid over the venerable old stone-work. Surely it would be better, cheaper, and more in the mediæval spirit to repoint the old masonry.

Round three sides of the large and carefully tended churchyard are old timber houses, and the village also boasts of one with a partially bricked-up Tudor door in the centre, the rest of it being taken up by a Classical portico and door (not in the middle, either), while the remainder of the front shows obvious traces of alteration from Tudor times. And there is yet another treasure—a farmhouse with two gables on its front, and the whole, right down to the ground, is richly timber-framed—one of the most interesting of its kind in the county. A few yards further down the hill and we come to where two roads meet—or, rather, where a narrow road branches off to the left from the main one. No signpost is there to say where either of the roads leads to, and the local authority appealed to in the matter declines to help the tourist—because, forsooth, there is one a couple of hundred yards further, at the extremity of the village, in the narrow road, where it is not needed and where the required route is obvious, though one of the boards on the post indicates "To Eastbourne," above all places! The so-called Eastbourne road leads across country, as it were, to the main road (a long way off) to Eastbourne, and is just wide enough for a pony-trap, with no room for a chance pedestrian, save in the ditch alongside. (Verily rural district councils are strange bodies!) Yet the surface is ideal.

We could not but feel duly impressed with the warning signboard of the little inn close to the way out of the village—the "Keep within Compass."

On reaching the signpost at this far end of the quaint settlement of humanity, we casually turned round to see how it looked from there, though the landscape that lay before us, on reaching pure country *once* more, was exceedingly alluring; and we candidly confess that we were most agreeably surprised in finding our eyes regaled by a fascinating *ensemble* of old-fashioned roofs and gablets and winding hill, embellished here and there with trees to the rear and on either side, and the church, on the outer edge of the village, looking of far better proportions than the view alongside from the main street gave credit for.

It is true this place runs Oxted very close for picturesqueness and irregularity, but there is not that astounding revelation of its existence that gives it so much additional charm. It is, *par excellence*, from this eastern side that the pedestrian should enter Bletchingley.

YORK AND YORKSHIRE ARCHITECTURAL SOCIETY.

AT the general meeting of the York and Yorkshire Architectural Society the following officers for the forthcoming session were elected:—President, Mr. Samuel Needham; vice-presidents, Mr. A. B. Burleigh and Mr. J. H. Rutherford; hon. treasurer and assistant secretary, Mr. R. R. T. Smith; hon. librarian, Mr. A. Cowman; hon. secretary, Mr. Harold E. Henderson; members of Council, Mr. W. T. Whipp, A.R.I.B.A., Mr. H. Monkman, Mr. K. Ward, Mr. J. Ferguson, Mr. F. Dyer; auditors, Mr. W. M. Carter and Mr. J. Reid.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) has devoted its chief illustrations to monographic reviews of recent work of Mr. Harry W. Jones and Messrs. Davis, McGrath and Kiessling. The former's buildings are in and around Minneapolis, and the latter's in New Jersey State, and chiefly embrace good-class domestic work.

La Construction Moderne (Paris) gives views of a villa at Rosendael, near Dunkirk, by Mons. J. Morel, of the usual modern French type, and of Moet & Chandon's pavilion at the Brussels Exhibition.

Der Architekt (Vienna) has an interesting article on the Kornmesserhaus at Bruck a.d.M., by Erich von Schrötter, with illustrations of its very late Gothic detail. The principal plates are less interesting than usual, but a good example of a modern Austrian school is given from Liesing, of which Herr Rudolf Eisler is the architect.

Berliner Architekturwelt (Berlin) illustrates two buildings of some importance in which the influence of the "Neu-bau" movement is only moderately felt rather than obtrusive—a club-house for the inspecting officers of the Landwehr, by Schmieden and Boethke, and a large school, the Herderschule, at Charlottenburg-Westend, by Hans Winterstein. Considerable space is given to details of various crafts allied to building, and there are some good domestic buildings, both single houses and blocks.

Deutsche Bauzeitung (Berlin) gives a description with illustrations of one of the most important monumental buildings of modern Berlin, the building for the Reichsmilitärgericht, overlooking the Lietzen See at Charlottenburg. Of this fine group of buildings Herren Kayser and von Groszheim are the architects.

Engineering Record (New York) has an abstract of a report on pipe subways in Great Britain, prepared by Mr. Nelson P. Lewis, chief engineer of the Board of Estimates and Apportionment of New York City, which deals with those in London, Nottingham, St. Helens, and Glasgow.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Architects and the R.I.B.A.

SIR,—The Institute is showing some anxiety as to the result of their Licentiate scheme, which obviously is not fulfilling the expectations of its promoters. This impression is strengthened by the letter from Mr. MacAlister published in your current issue, and by the steps which are being taken or are in contemplation by the Institute for pushing this branch of their work.

I do not, however, wish to enlarge upon this, but rather to ask you kindly to allow me to refer chiefly to the more important question of registration.

According to Mr. MacAlister, the Institute is pledged at an early date to make application to Parliament for the recognition of all *bonâ-fide* architects; but he omits to state, what is common knowledge, that for the purpose of registration the Institute will only recognise architects who are at the time members of one or other of the classes within the Institute.

The essential difference between the proposals of the Institute and of the Society in regard to registration is that the Bill which the Society is promoting, and which has been amended in detail in view of the coming Parliamentary session, provides for the registration of all *bonâ-fide* qualified architects in the United Kingdom, whether members of any architectural body or not, whereas the Institute propose to legislate for a section only.

If two Registration Bills are presented to Parliament it is apparent which of them will receive the most support, as Parliament will not grant a monopoly or shut out vested interests.

The Society of Architects, while prepared to meet objections on points of detail in regard to their Bill, will not give way on the principle—that is, registration of the whole profession. Architects who become Licentiates of the Institute on registration grounds are, therefore, wasting their time and money, because registration of the profession can only be secured by a Bill similar in principle to that promoted by the Society, and it is only a Bill on these lines which has any chance of becoming law.—Yours faithfully,

C. MCARTHUR BUTLER,
November 11, 1910. Secretary, Society of Architects.

Petrol Air-Gas.

SIR,—I am greatly interested in the articles appearing on the above subject, particularly as the owner of country property. I sincerely hope that Professor C. A. M. Smith will include in his articles some suggestions as to the best form of machine. Personally, I have been somewhat dubious as to the safety of this form of illumination, and am very anxious to see some decided statement on the subject from some one outside the manufacturer or patentee. I gather from the letter in your last issue that "F. I. C." is somewhat in the same position. I have seen most of the systems on the market, and have been much impressed by this new illuminant, and must thank you for publishing that which, I believe, will be invaluable to many men situated as I am. As I am not desirous of being inundated with lengthy communications from the several manufacturers, I prefer not to attach my name and address, but beg to subscribe myself, your obedient servant,

INQUIRER.

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The Architect.

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FORTHCOMING EVENTS.

Friday, November 25.

Glasgow Technical College Architectural Craftsmen's Society: Mr. John R. Hacking on "Belgium."

Monday, November 28.

Royal Institute of British Architects: Chevalier Professor C. Formilli on "The Monumental Work of the Cosmati at Westminster Abbey."

Architectural Association: Mr. Andrew Oliver on "Cathedrals of Southern France."

Tuesday, November 29.

London Local History Association: Mr. W. R. Lethaby on "London Under the Normans."

Thursday, November 31.

University College, London: Mr. J. A. Gotch on English Domestic Work; Lecture (6) on "The Drawings of Jacobean House Designers."

Monday, December 5.

Royal Institute of British Architects: Mr. Reginald Blomfield, A.R.A., on "Pierre Lescot and Jean Goujon."

Liverpool Architectural Society: Mr. Albert H. Hodge on "Architectural Sculpture."

REGULATIONS FOR ARCHITECTURAL COMPETITIONS.

THE revised regulations of the Royal Institute of British Architects as now put forward after the incorporation by the Competitions Committee of the suggestions and views expressed by the general body of members may be said to be of a fairly satisfactory character, and, at any rate, an improvement on those that have previously existed.

One of the best clauses in the whole document is the assertion that "Members of the Royal Institute of British Architects and Allied Societies do not compete excepting under conditions based on these regulations." The document is intended to be for the use of promoters of competitions, hence it is desirable to state the position clearly, so that promoters may understand that if they wish members of the Royal Institute to compete they must conduct their competitions in a manner which the Royal Institute considers will secure the best results to the promoters with scrupulous fairness to the competitors.

It is sometimes said that the Institute should not attempt anything like dictation to the promoters of competitions, but we are glad to see, as was shown at the business meeting on Monday last, that the architectural profession rightly recognises at the present day that in every architectural competition it is the promoters, and not the profession, who get the best of the bargain. Hence it is only equitable that the benefactors and not the beneficiaries should settle the terms.

Every individual or body of individuals who is going to pay for the erection of a building is at undisputed liberty to employ any particular architect he or they think fit; but if employers mistrust their own discretion to obtain the best possible design without a competition, then the profession of architects, who are going as a whole to make considerable sacrifices in order to assist in obtaining the best design, is entitled to specify the manner in which the competition shall be conducted to attain that end.

It has been urged, with some show of reason, that the promoters who find the money for a building have a right to select the design amongst those submitted in competition which they consider most suitable; but if they are competent to do this, they are equally competent to choose a design without a competition and without the exaction of a large amount of unpaid labour, wasted time, and fruitless expense that we fear must always, more or less, be an accompaniment of competitions unless each competitor is to be paid such a sum as will fairly recompense him for the work involved.

Hence the Royal Institute is fully justified in laying down the conditions under which alone its members do compete. The point was raised at Monday's meeting as to how the fidelity of members to these conditions is to be ensured, but was properly ruled out by the President in the chair. That is a matter of internal discipline in the body corporate of the Royal Institute, and has nothing to do with the promoters of competitions. There ought not in this matter to be any necessity for discipline. Simple loyalty ought to be sufficient to ensure the truth of the statement that members do not compete except under the conditions approved by the general body.

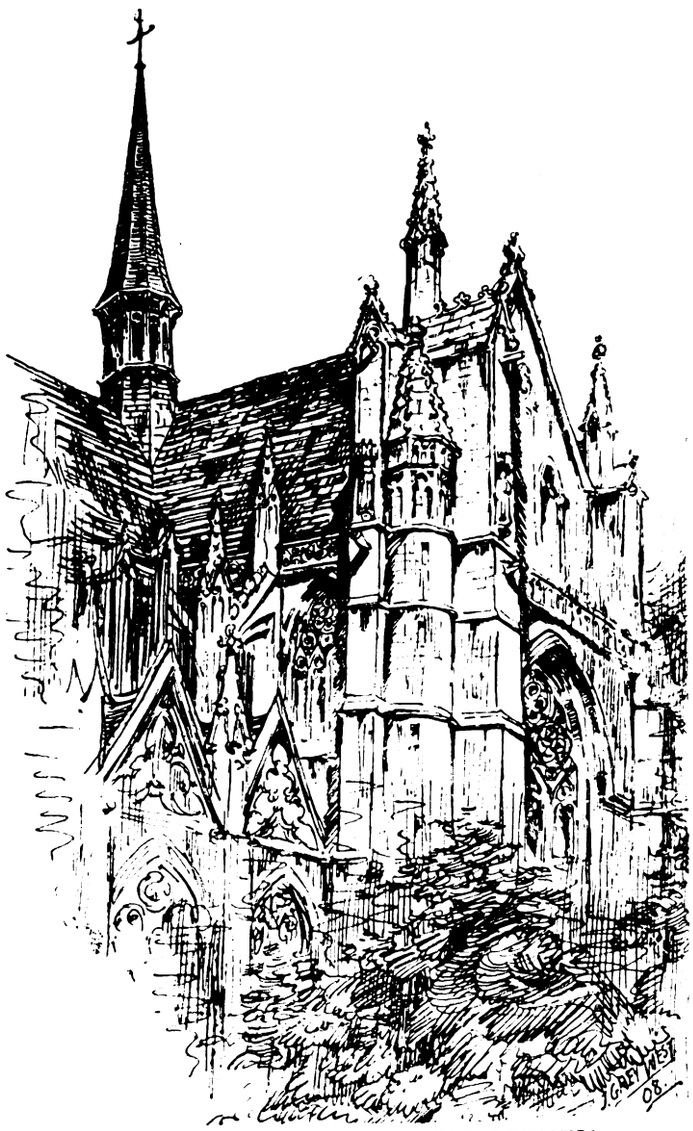
A distinction is rightly drawn in the regulations between things that are essential and those that are merely advisable or desirable, and the same distinction is recommended in the conditions of a competition itself. The essential points of a fairly and wisely conducted competition as defined by the regulations are, briefly, the appointment of an Assessor, the abstinence of promoters and Assessors from participation in a competition, the *bonâ-fide* preparation of his design by each competitor, the award of premiums and the appointment as architect by the fiat of the Assessor, the adequate payment of a successful competitor if the work is not proceeded with, and the proper payment of a successful architect.

The duties of an Assessor are enumerated, and the various classes of open and limited competitions are explained. Nothing is now said about double-barrelled competitions, but we see nothing in the regulations to debar them if the Assessor should think this method desirable. As, however, it is now stipulated that the number and scale of the drawings are to be reduced to a minimum and perspectives are discouraged, much has been done to reduce the wastefulness of competitions, and in these circumstances it is perhaps hardly necessary to resort to the somewhat cumbersome and not altogether satisfactory system of double-barrelled competitions.

The onus of reconciling the antagonistic elements of accommodation and cost is thrown on the Assessor, whose duty it is stated to be to advise the promoters on this point, and non-compliance with either as set forth in the conditions is to be a reason for disqualification; but a saving grace is to be allowed the Assessor to disregard the exact outlay stated in the instructions if he considers the same inadequate. Generally the amount is inadequate if both it and the amount of accommodation are settled by the promoters, and it is to meet this case that the saving grace is to be allowed. It is, of course, open to an Assessor, when he draws up the instructions, to distinguish between which of the stipulations is essential and which desirable or suggestive, and this, we think, the Assessor should always do if either or both the amount to be expended and the accommodation to be provided are to be regarded as rigidly fixed.

The Competitions Committee has done its work excellently well in incorporating in the new regulations the views now held by competing members of the Institute

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CATHEDRAL OF ST. GUDULE, BRUSSELS.
From a Sketch by Mr. J. Grey West.

as expressed in the previous discussion, so that on Monday last there was little change made except in the way of verbal amendment to the recommendations placed before the general body.

NOTES AND COMMENTS.

Is it good form for one architect to publicly proclaim his ideas for the improvement of another architect's design, and still more for the completion of an unfinished work? Professor Pite has rushed into the columns of the *Times* with a letter and "sketch block plan," showing how Sir Aston Webb's archway into the Mall might be connected with Charing Cross. Sir Aston Webb has doubtless made many sketch block plans for the solution of a difficult problem, and he has made them with a far more intimate acquaintance with the conditions of the problem than Professor Pite can possibly possess. As far as we are aware, Sir Aston Webb has not yet made public his solution of the problem, and it is, in our opinion, somewhat impertinent on the part of Professor Pite to tell the public how Sir Aston Webb or any other architect ought to finish work of which circumstances have prevented the completion.

But Professor Pite's sketch block plan has not even the merit of originality. It is a mere plagiarism, without acknowledgment, of that shown by Mr. Leonard Stokes in the recent Town-planning Exhibition at Burlington House, the obvious puerility of which caused it to be generally regarded as an excellent joke on the part of the new President of the Royal Institute. Does Professor Pite think that he is on the way to establish a reputation as a town-planning expert by this sort of performance? There are better opportunities offering for him at the present time. Let him win, if he can, one or both of the competitions in town planning that are now open at Knightsbridge and Ruislip. It is lamentable to think that the volcanic imagination of El Dorado Pite has fizzled out to such a pitiful emission of dust and ashes as the plagiarism in the *Times*.

The Westminster City Council Improvements Committee are desirous of seeing the entrance to the Mall from Charing Cross take the form of a roadway 66 feet wide without the pavement, or 88 feet in all. The trouble is, of course, the expense, and so it is proposed by the Committee that a conference should be held between representatives of the Office of Works, the London County Council, and their own Council. It is the same old story that is just now being more than ever reiterated, plenty of grand town-planning schemes—anybody can make these, on paper—but how they are to be paid for, how they can be shown to be financially possible is work for the man with more ability than is necessary for merely manipulating a parallel ruller and a bow pencil.

The City Corporation and the London County Council having composed their differences, it appears probable that tramway extension will form part of the scheme for the new St. Paul's Bridge, and hence the warning of Mr. Mervyn Macartney is timely. The Cathedral is admittedly in a tender condition, and any undermining of the foundations for a tramway subway would very possibly bring about a catastrophe. The Chairman of the Bridge House Estates Committee is persistent in his idea that the Royal Institute of British Architects wish to impose some definite scheme upon the Corporation, and Mr. Leonard Stokes, the President, has again had to point out in the *Times* that this is not the case, and that all that the Royal Institute desires is that the Corporation shall be well advised and not make a blunder when a fine opportunity occurs for a work of which London may be proud, both for its artistic and its economic merits.

Alderman W. H. Bowater, on his re-election for a further year of office as Lord Mayor of Birmingham, made special reference in his speech returning thanks for the honour to town-planning, and said that within the last twelve months this Council has done more than any other municipality towards putting the Housing and Town-Planning Act into operation. The Town-Planning Sub-Committee is hard at work upon two schemes—one relating to Quinton and Harborne, and the other dealing with Ward End and Washwood Heath. The Corporation wishes to take full advantage of the new Act, in order to develop certain definite areas upon proper lines, to the mutual advantage of the landlord, the tenant, the builder, and the community. No city which leaves the development of its suburbs to the undirected enterprise of unconnected individuals should expect harmony, beauty, or convenience in its buildings, streets, and open spaces. In laying out the districts which have already been marked for town-planning, and any of the new districts that may be added to the city, we shall have the opportunity of applying the knowledge gained by the deputation, of which I was a member, during a recent study-tour in Germany and Austria. In some of the towns we visited we learned how to do things, and in others how not to do them.

The Lord Mayor explained the difference between the German system of local government and our own. The German Burgomaster is a salaried permanent official, appointed by the Government. He presides over a Council, of which about half the members are salaried officials, each responsible for some department of the municipal

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administration. The Government, while exercising some supervision over the appointment of Burgomasters, has less control over the local expenditure and the local by-laws than we have. Municipalities there can amalgamate, they can buy land, they can carry out public works, and they can compel people to do things that are not required by the law of the land, such as attendance at evening continuation schools, without obtaining a Provisional Order or suffering the inquisition of a Local Government Board inquiry. So there is more scope for municipal enterprise in Germany than in this country. The German Municipal Councils are elected on a basis that is quite contrary to the principle of one vote one value. The ratepayers are divided into three classes, and each class is represented in proportion to the amount it contributes to the municipal exchequer. For instance, in the town of Aachen, which is a fair example, the 130 rich people who pay one-third of the rates between them elect one-third of the Council, the 1,200 middle-class, who contribute another third between them, elect another third of the Council, and the 8,000, the working-class, who drop their mites into the treasury, are represented by the remaining third. In spite of this undemocratic franchise the municipalities of Germany show a very liberal spirit in the spending of public money. They lay out sums we should not dream of in providing open spaces and parks, making roads, and erecting public buildings, theatres, schools, and hospitals. Although the feudal tradition survives in the rural parts of Germany, its place has long been taken in the towns by a spirit of civic pride, local patriotism, and a willingness to subordinate personal interests to the welfare of the community. That is the spirit we shall require in dealing with problems of city extension and town planning.

THE SOCIETY OF ARCHITECTS.

THE first ordinary meeting of the Society of Architects for the session 1910-11 was held at their new premises, 28 Bedford Square, W.C., on the 17th inst. Mr. George E. Bond, J.P., President, occupied the chair. After some preliminary business, Mr. Bond delivered his

Presidential Address.

After returning thanks for his election for the third consecutive year to the post of President, Mr. Bond alluded to the continued growth of the Society. Since the last annual meeting forty-three members, two honorary members, and forty-five students were elected. One of the strongest and most consistent advocates of registration had, however, been lost through the death of Mr. Robert Walker, of Cork. Another loss, though of a different character, was the retirement of Mr. Ellis Marsland from the office of Hon. Secretary. On the subject of the new premises, Mr. Bond said he hoped their extension at the back would not be long delayed. To provide the necessary funds for a larger assembly hall, and for the costs of the alterations already made, financial assistance had been invited from all who desired to see the Society take that position in the professional world to which it was entitled as a reward for its energy and persistent efforts to secure for all *bonâ-fide* architects the privilege of practising their honourable calling in a manner compatible with the inherent instinct of gentlemen, freed from the materialistic influences of debasing competition with those untrained and unqualified persons who are now forcing many men with small opportunities to descend in self-defence into the arena and fight them with their own weapons.

After these preliminary remarks, the main point of the address was reached, and the remainder of Mr. Bond's address is given below in full.

Registration.

A new situation has arisen with regard to registration, and, although it may appear incredible, it has been seriously suggested that in the name of unity the Society ought to cease its existence as a distinct organisation, and this at a time when its position is stronger than at any previous moment in its history, when it is increasing its membership more rapidly than ever before (some thirty names have been added to the list this evening), and when it has added enormously to its responsibilities by the acquisition of new premises; and that after twenty-six years of strenuous propagandist work in favour of registration we should hand over the fruits of our labours to a body which has always opposed our efforts and which, I submit, quite unjustifiably claims the right to dominate the interests of the profession generally.

And what is to be our reward? It is suggested that we shall forfeit our present position as corporate members of an important, influential, and constantly growing Society, sink our individual self-respect, and voluntarily degrade ourselves by entering the ranks of another body, through the only door which its unwisdom has left open; that is to say, as members of an inferior grade, paying a smaller subscription than its other members, and in the management of which body we shall have neither voice nor vote. We are invited to do this solely in order that the profession may appear to speak with a unanimous voice in asking Parliament to pass a half-hearted Registration Bill, a Bill which in my opinion will add to, rather than decrease, the difficulties of our practice; for upon all questions of professional etiquette and recommendations and advice with regard to professional practice, and every other point, except registration, the Society has always supported the Royal Institute to the utmost of its power and will continue to do so, proving that unity of action can be attained without fusion.

The Society's Influence.

My present intention is to justify, if that be necessary, our existence as a distinct organisation, and I say without hesitation that in the past the Society's influence has been considerable in moulding the thoughts and guiding professional policy both in this and other countries. Twenty-six years ago the Society was founded for the purpose of endeavouring to remedy the evils and check the growth of abuses which the apathy of those whose duty it was to perform this work had allowed to accumulate and grow. We may safely assume that had the parent institution been animated at that time by the life and spirit of its later years, had it shown any inclination to adopt a progressive attitude or to seriously consider the demands of the profession generally, that action should be at once taken to check the growth of those abuses which were gradually sapping its life's blood, then there would not have been any "Society of Architects" to-day. But where the leaders hold haughtily aloof, neglect the interests, desires, and it may even be the prejudices of their humbler brethren, then loyalty is strained; nay, it even languishes and dies, for the spirit of loyalty depends upon personal esteem, affection and respect.

The Present Situation.

To arrive at a correct understanding of the situation as it existed when the Society was founded, and which continues to-day, we must first recognise the facts that the maintenance and advancement of the higher interests of architecture as an art, and the initiation and development of a policy governing professional practice, are distinct problems. Secondly, we must recognise that the work included within the legitimate practice of an architect covers an exceedingly wide field, and that, as a consequence, the qualifications required for the satisfactory performance of the various duties involved are equally wide in their scope.

At one end of the scale we have men of undoubted talent and ability, many of whom are able to specialise in works of a more or less monumental character. Some commenced their career with every possible advantage, and after a university education entered offices full of the best work; while others with influential or wealthy connections have been able at one step to reach the same high plane, a plane upon which their future labours may be carried on entirely free from the strain of dishonourable and crafty competition. These men of great opportunities should be the makers of the architecture of to-day; to this class we look for artistic guidance; they are qualified for research work, and with their many advantages should with pencil and pen assist their humbler brethren to reach a higher level in art than would be the case without their assistance; their duty and pleasure should be to advance architecture as an art, and for this work they are fitted.

But the advantages they have enjoyed and the special talents which qualify them for this work are the main causes of their inability to understand and appreciate at their proper value the difficulties of their less fortunate brethren; for at the other end of the scale we find equally earnest and conscientious men, most of whom entered the profession in possession of the same lofty ideals, and animated by the same high aims as their leaders, but with fewer advantages, and perhaps less ability, and being at the same time less fortunate in their environment they are

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glad to eke out a scanty living by performing work which would be scorned by the aristocracy of the profession, but which nevertheless has to be performed.

Between these extremes we have the large body of general practitioners, the backbone of the profession, whose opportunities are being curtailed every day. Works which should be distributed over a county are centralised in an office under a public official, and for what is left they have to compete with the unqualified and sometimes dishonourable practitioner.

Our great art leaders were not, nor are they now, competent to deal with this great question of professional policy; it was beneath their consideration a quarter of a century ago, and their ideas are still the same. We have all along wished to relieve them of this obnoxious duty, but they are neither willing to perform it themselves or allow it to be performed by those who, as a result of practical experience, are better qualified to do so.

Some Obstructions to Progress.

The greatest obstruction in the way of progress, however, is the selfish individualism of the successful architect.

It has required a quarter of a century of propagandist work to even partially break it down, and as each man naturally desires to reach the highest possible level of success, it inevitably follows that within their special spheres every man is his brother-practitioner's competitor. What is one man's gain is considered a loss by the other, there is apparently no community of interests, and their local relationships have, at best, been but a condition of armed neutrality. To the working of the individualistic spirit may be attributed the fact that practically one-third of the practitioners in the United Kingdom are not attached to any professional organisation; and, further, we may safely assume that of those who are members of one body or another, not more than 30 per cent. are actuated by any sincere desire to promote the interests of their respective associations; they neither trouble themselves to vote for the election of officers or council nor, in some instances, do they loyally fall in with recommendations of the council to abstain from competing under unfair conditions, but they pay their annual subscriptions solely for the purpose of being able to affix some proportion of the alphabet to their names, and to increase their apparent importance in the eyes of an undiscriminating public.

It was very necessary to teach architects that such conditions are deplorable, and that under them the general well-being of the profession is being steadily undermined; that abuses of all kinds are growing practically unchecked, that competition drawings are invited and freely submitted subject to unfair conditions, and that two-thirds of the less important works throughout the country are being carried out by other than recognised architects, to the detriment of both architects and clients, all because members of the profession have not seen fit to combine for the protection of their general interests.

Everything, therefore, which tends to unite members of our profession by the bonds of social intercourse, common aims and sympathy, must necessarily be of immense value in promoting the ultimate benefit of architects and of architecture.

The Society's Policy.

The policy of the Society of Architects is founded on this basis, and I venture to say that architecture, and incidentally the best interests of the profession, have been generally promoted in direct proportion to the growth and success of the Society. It has had a quickening influence, and has been the indirect means of putting energy into others, and awakening their executives to a fuller appreciation of the needs and desires of their members. That the Society was not formed in any captious spirit of opposition is proved by the fact that its Council at once set its mind to an earnest consideration of these evils, the nature of which had been freely ventilated without securing attention elsewhere, and the immediate result of its deliberations was that it determined to promote a scheme of compulsory training and registration, to be applied to the whole profession, as the only practical and effective remedy for the deplorable conditions complained of.

With this aim in view it called for and received the willing aid of experts, both within and without the profession, to advise and assist in the drafting of a Bill to be presented to Parliament, one of these gentlemen being His Honour Judge Emden, whose work on building contracts, leases and statutes, is a recognised standard work, and who was inferentially well acquainted with the legal obligations of architects and the difficulties of their position.

An Active Propaganda.

The Bill was drafted and presented, with the results which are known to you, and, although it has been persistently opposed by the Royal Institute upon every possible occasion, still I venture to say that not one practical argument against its principles has been adduced. All adverse comments have been more or less of a sentimental character. In the face of this opposition your Council has steadily persevered, fully determined to secure the ultimate success of its great object. Sparing neither time nor money, members of the Council and honorary officials have at their own cost visited various centres of influence, where they have delivered lectures, initiated discussions, and by every reasonable means endeavoured to teach the true nature of the proposition, and the great advantages the profession as a whole would reap as a result of successful passage of the Bill through Parliament. They inculcated a spirit of brotherhood and unity, pointing out that it is the duty of every architect to support financially, and by voice and pen, a movement designed to free the building public and also themselves from the evil results of incompetence and dishonourable practices; and we must acknowledge that they were eminently successful in their efforts, for we now know, through the kind offices of the *Builder*, that a vast majority of the practising architects in the United Kingdom is in favour of registration.

In addition to the Registration Bill, the Society actively supports all movements calculated to improve the architectural character of our streets, squares, and public buildings, and to preserve our ancient monuments, its advice is sought and freely given upon matters affecting the rights, privileges and duties involved in architectural practice, and its executive has at all times honestly and conscientiously endeavoured to fulfil the duties it owes to the members and to the profession generally.

I venture, therefore, to assert that the Society of Architects has fully justified its existence, and that it thoroughly deserves the continued support of all those who desire the success of the registration movement. I can assure you that the Society is fully determined to persevere in its efforts to pass its Bill through Parliament, and is at the present time engaged in the work of revising the Bill with a view to bringing it up to date. At the same time, it is perfectly willing to discuss both the theoretical and practical nature of the proposition with other interested parties; our desire is for a sound Registration Bill, no matter by whom it may be promoted, but the central principle, which we cannot agree to alter, is that it must be compulsory and universal in its application.

Other Registration Bills.

With regard to the suggestion for a Bill to be promoted elsewhere, let us for a moment consider what would be its probable results to our practice.

The chief object of a Registration Bill, from our point of view, is to ensure that in the future no person shall be allowed to perform for payment any of the duties involved in the recognised practice of architecture unless such person has been adequately trained and has proved his qualification to perform those duties by passing the statutory examination.

It is fully recognised by all parties that such an ideal cannot at once be achieved; there must be a transition stage, for if there is one thing certain in practical politics, it is that under any Bill likely to be approved by Parliament the vested interests of all persons describing themselves as architects and practising as such will be protected, whether or not they practise architecture in combination with some other calling, or are qualified according to the prescribed standard. All that we hope to secure in the immediate future is that those conditions which foster the unqualified practitioner shall cease immediately the Bill is passed, leaving those at present practising to be gradually eliminated by natural causes.

Is the alternative Bill calculated to secure this object? As a result of prolonged consideration of the proposal as informally explained to us, I am fully satisfied that it will not. I have not seen a draft of the Bill, but, judging from the writings and speeches of its promoters, its chief purpose is to secure for the Executive of the Royal Institute complete and permanent control over the interests of the profession as a whole. The Bill is being promoted by those who have for sentimental reasons alone consistently opposed statutory registration for a quarter of a century; they have objected to a scheme under which the names of some unqualified persons might appear in the same registration list as their own (which, by the way, they do now in most professional directories), and I venture to say that, with a few dis-

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tinguished exceptions, these gentlemen are still equally determined to maintain their attitude on this point; they will not have universal registration, and it is only because the progressive forces within their ranks have made their voices heard that they even contemplate what is after all but a compromise with regard to the movement. That such is the case their course of action during the past two years abundantly proves. The central point in the suggested Bill is registration within the ranks of the Royal Institute, but they recognise that in order to secure the passage of such a Bill it must be backed by the unanimous voice of the profession, and an appeal has been made to the profession that it should become united under the banner of the Institute.

Now, desiring unity in such a cause, one would have expected to find the leaders prepared to make some small sacrifice in order to secure it; but such a thing never occurred to them. I have the greatest possible respect and admiration for many of these gentlemen individually, but I am bound to say that collectively they appear to be obsessed by such an exaggerated sense of their own superiority that they are unable to understand the elementary fact, that there are outside the ranks of the Institute many fully qualified men who value their honour and self-respect as highly as any of those within.

The Licentiate Scheme.

The initial step taken in the movement designed, as they say, to secure unity was to amend (?) the charter in such a manner as to close their ranks to the honourable admission of even the most eminent and qualified practitioners who were not then members; and this at a time when less than half the practising architects in the United Kingdom were included within them; and as an act of grace they offered, instead, cheap admission to an inferior grade which, had it been taken advantage of, would have had the effect of branding many fully qualified men of long and honourable standing as being inferior to their assistants; and further, there was an implied threat that all those who did not apply within one year for admission as licentiates were to be left outside the recognised ranks of the profession and subsequently treated as a negligible quantity, without standing and unworthy of further notice.

This is an absurd proposition, for while it is quite possible that a law may be passed compelling all present practitioners to register themselves as architects and to provide that all future candidates for admission to the register shall pass a qualifying examination, no sensible man can believe that it is possible to compel any person by statute to join any particular institution under a penalty for non-compliance of losing his professional status.

It is suggested that if all qualified men now join the Institute the building public in future will only recognise as architects those within its ranks, but, speaking as a result of long experience, I venture to say a large section of that public cares nothing about diplomas, but will in the future as in the past get the work done in the cheapest possible market, with the same deplorable results, both in the quality of the work and to the interests of *bona-fide* architects; and as it is the avowed purpose of the promoters of that Bill to register only within the ranks of the Institute, and only such persons as can prove their present qualifications, it necessarily follows that such registration can only be voluntary, and that there would still remain outside its jurisdiction a large class of unqualified nondescripts, many of whom simply perform architectural work as a means of adding to the incomes they derive from their more legitimate callings, and most of whom would never attempt to register under a compulsory Bill.

This very class, however, is the chief source of our present difficulties, whose ultimate extinction statutory registration is intended to secure, and any Bill under which it is to be allowed to develop in the future at its own sweet will would be simply a repetition of the great mistake made by the dentists in 1878, a mistake they are now straining every nerve to rectify; a task rendered doubly difficult by the large vested interests which have since been acquired by a similar class to that which we wish to eliminate from our ranks—a class which I venture to say cannot be touched under any Bill which deals exclusively with the interests of a particular institution.

The Position of the Institute.

In summing up the position I would say, while such a Bill might add to the importance of the Institute, it would be utterly futile from our point of view; it would not remedy the evils complained of by the general practitioners, nor would it check their further growth; were it now passed a large number of our brethren accepting the shadow for the substance, lulled by a false sense of security, and trusting to the statement made by one of its strongest supporters, that an upward advance would begin at once, would again go to sleep, and a generation hence the profession would wake up to the fact that instead of the ranks being cleared of the undesirable and unqualified (as they would have been under a compulsory and universal Bill), this class had largely increased both in numbers and variety, that new vested interests had been created and the difficulty connected with their ultimate suppression increased tenfold. Our successors would then have just cause to lament the fact that in the year 1910 there could not be found within the ranks of the Institute a man of strong personality to champion the cause of the thousands by leading an attack upon the untenable position then held by a small oligarchy of great artists, who formed the only obstruction standing in the way of universal registration.

A Bill, no matter by whom it may be promoted, has not the slightest chance of success in Parliament if opposed by any considerable section of the profession, and I believe that the vast majority of our brethren, both within and without the Institute's ranks, are in agreement with us as to the necessity for universal compulsory registration. I venture, therefore, once more to invite our leaders in the profession to reconsider the situation; I suggest to them that their exalted position calls them to higher duties than those involved in the mere administration of routine registration work, for which they are totally unsuited by tradition, natural instinct, education, and the lack of experience of the difficulties surrounding the practice of their humbler brethren. I ask them to consider whether the Royal Institute will be able to maintain its present position as a Court of Honour should it be hampered by the duties connected with the administration of a Registration Act. Could it penalise members for the infraction of various articles of its code of professional honour? For instance, a member might persistently violate such a code and still keep within the letter of the common law. Could it exclude such member when the exclusion from the organisation would carry with it the future penalty of the loss of his right to practise? Would not the general tendency be to lower the present standard of professional morality and honour as between professional men down to such a standard as could be maintained in a court of law? Is it worth while for the Royal Institute to run this great risk simply for the purpose of arrogating to itself a duty for which it has neither the aptitude nor taste. Far better will it be to leave the entire administration of any Registration Act in the hands of a Central Council elected and appointed for the purpose.

The Position of the Society.

We look to the leaders in the Institute to maintain the honour and integrity of the profession generally and to advance its best interests, to exercise their great talents in spreading culture and in endeavouring to develop in us all a more perfect sense of artistic proportion, which will the better enable us to appreciate the truthful, beautiful and powerful in good work. We expect them to maintain the dignity and high importance of the Institute as a centre from which may radiate those good and useful influences which lead to the organisation of congresses, conferences and gatherings called together for promoting the art and science of building, and ask that it shall progress and develop along the lines it has laid down during the quarter of a century of its renewed activity. In all these things the Society of Architects is prepared to follow its lead and actively co-operate with it where necessary, and I look forward, hoping that in the immediate future the only jarring note between us, viz., that of registration, will be struck out, and that with perfect unity in our aims and objects we may work together harmoniously in promoting the best interests of architecture and architects.

We cannot tell what the next few months may bring forth, but if agreement cannot be secured I know we can look forward with confidence to the loyal support of our members; it is too late in the day for the wishes and desires of the Society, with its large membership, to be ignored, and I invite those who are not members of any association and who are in possession of the necessary qualifications to join the Society, and support us in our efforts to obtain a cessation of the conditions favouring the growth of the unqualified element in our ranks, and thus assist us in maintaining our position in the work which lies before us.

At the conclusion of the address a vote of thanks was proposed by Mr. H. G. Todd, and seconded by Mr. C. L. R. Tudor. The discussion was continued by Mr. E. J. Sadgrove (hon. treasurer), Mr. Ellis Marsland (past hon. secretary), Mr. G. A. T. Middleton, and Col. F. S. Leslie, R.E. (retired). Mr. Geo. E. Bond, the president, having replied, the meeting terminated.

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THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on the 14th inst. jointly with the Camera Sketch and Debate Club. This excellent innovation no doubt accounted for the ready discussion which followed the reading of short papers by Mr. Gerald C. Horsley, Mr. Halsey Ricardo, and Mr. Ernest Newton. These papers were reported in full in our issue of last week. We now give the chief points raised by subsequent speakers on the motion.

That Fine Draughtsmanship Conduces to Fine Architecture.

Mr. C. S. SPOONER opened the debate. He contended that drawing must always play an important part in an architect's work, and therefore it ought to be done as well as possible. He, however, differed from the assertion of Sir William Richmond, which Mr. Horsley had quoted, to the effect that the artist who could correctly delineate the human figure could design a picture, make a statue, or build a cathedral. Such a statement was altogether too strong. There were many modern painters capable of drawing the figure as well as it could be done, and yet they could hardly design a picture. The designing of a picture required other qualities than that, such as fancy, having something to say, and a sense of colour. Again, the skill of the modern sculptor was astonishing; and yet who would compare modern work with that of the thirteenth-century sculptors—say, at Amiens. Then, again, he would ask how was one to build a cathedral with the knowledge obtained from drawing from the figure. Undeniably, drawing from the figure was the very best training an artist could have, whatever he might be, and the study should go on through life. It kept the artist's eye keen to the sensitiveness of curve and open to those fine qualities which the architect needed. As to what Mr. Horsley had said about fine draughtsmanship, it was doubtful if Mr. Bodley or Mr. Butterfield had ever reached such a high standard. The main thing was not to make a drawing to look clever or strong; that could be done with facility or difficulty, as the case might be. Great facility was certainly a danger. It was said of Burne-Jones that he had difficulty to the end in drawing. And yet his drawing possessed great merits. Good draughtsmanship was brain-work, and brainwork was always difficult. Architects, whose business it was to build beautifully, could never hope to draw as an artist like the late Mr. Swan, R.A., did after concentrating his life's work on it. Architects had to consider the business side of their calling. However, draw they must, and the better they did it the better chance there was of their ideas being realised by those with whom they worked.

Mr. C. F. A. VOYSEY remarked that he felt as if he had been called not to praise Cæsar but to bury him. The first passage in Mr. Horsley's paper in which he would like to try to pick a hole was that in which he said: "The sketches we make for our clients, to show the grouping of our designs, should not be mere diagrams: they should be drawn with intelligence and care, to create an interest in our purpose and an understanding of our aim." To his (Mr. Voysey's) mind the less clients with uncultured tastes understood an architect's drawings the better. On the other hand, the details for the use of the workmen—*i.e.*, the working drawings—should be made with a real sympathetic endeavour to understand their difficulties in the interpretation of architectural drawings. Consequently clearness and directness were essential, also completeness. Architects ought to think of the poor workmen who have had no training and who must make the best they can of the drawings. Never mind about the client. The workman is the fellow who has to put the designer's ideas into lasting form. Mr. Horsley had argued that, according to past experience, if they did not measure and sketch, they would be poor architects. Evidently, said Mr. Voysey, that was meant for him, as he had never drawn and measured, believing that the more one did so abroad the worse one's architecture would be. Experience proved that sketching and measuring has produced the dullest dead-and-alive work. Sir William Richmond had been quoted as saying: "The artist who can delineate the beauty of the human form, who is scientifically conversant with its structure as a machine, is possessed of a power limitless as art itself. He can design a picture, make a statue, or build a cathedral. This is a startling assertion, but it has been proved over and over again to be a true one. The artist who is not possessed of this power is minus, I was going to say, everything." All this, declared Mr. Voysey, was absolute rubbish, the exact opposite being true. Ruskin very much deprecated the study of anatomy. Drawing from life has led to such atrocities as the sculpture on the Medical Association's building in the Strand. It was quite distressing to have to pass such a building.

Mr. STANLEY HAMP said, whereas most had seemed to agree with Mr. Voysey, he personally could not follow all Mr. Voysey had intended to suggest. In his opinion it was very important that the architect should be a good draughtsman—*i.e.* he should be able to express himself in a reasonable and workmanlike way. On the other hand, it was not necessary for him to have the degree of draughtsmanship necessary for a painter. Mr. Horsley's paper had said all that could be said on the subject, and it had encouraged them as students to learn how to draw correctly and with all the character that was in them, to give expression to their own thoughts in an artistic way. If they were artistic they must produce their diagrams in an artistic way. It must be a great help to an architectural student to be taught to draw well, for it was very essential in his studies. He maintained that anyone studying abroad would get far more out of his studies if possessed of the knowledge and power to express on paper the things that he saw before him. The architecture produced by the man capable of fine, clear draughtsmanship would, he believed, be finer and nobler than if he lacked that power of expression.

Mr. T. L. DALE said he was inclined to regard the motion as pure nonsense. It was tantamount to arguing that fine penmanship conduced to fine literature, and that if anyone wanted to be a second Robert Louis Stevenson they must learn typewriting. The sole thing that mattered was the idea of the artist, and so long as that idea could be put down so as to be clear to the workman that was all that was needed. Draughtsmanship constituted a very great danger, and as such should not be urged on a student of the Architectural Association. The value of draughtsmanship lay in its assistance to "spoof" one's clients; and, so far as that went, it certainly conduced to fine architecture. But there existed a serious danger that in spoofing one's clients one spoofed one's self. The whole of architectural history seemed to be against the contention. All the great architecture of the past had been produced with a minimum of drawing, and certainly with no fine draughtsmanship. If one got into the habit of making dry drawings one would run very much less risk of deceiving one's self.

Mr. A. G. R. MACKENZIE argued that the only thing necessary in draughtsmanship was accuracy in drawing and showing shadows. Fine draughtsmanship was a snare and a deception. If a man was a good designer, and if he knew modelling and construction he was bound also to be a good draughtsman, or at any rate good enough.

Mr. HERBERT A. HALL thought that the argument was that if a man had something to say in drawing he would probably say it as well as he possibly could. The great thing was whether he had anything to say at all. A very distinguished architect was shown some plans the other day, and after he had inspected them on the floor he asked why they had not been worked on with charcoal for three months. The architect meant there was an amount of preliminary work still to be done. Mr. Hall said he would like to hear where fine draughtsmanship began and workmanlike drawings left off.

Mr. W. CURTIS GREEN considered that the fashion of fine drawing was wholly a means to an end. In the first place it was of extraordinary value to students because it created enthusiasm. The young student could not arrive straight off at an enthusiasm for design, he had to attain it by some process; and one of the processes was by fine drawing. Another important view of the subject was as to the effect of fine drawing on the workman himself. If in the rush of work carelessly executed drawings were sent, for instance, to a joiner's shop, they must inevitably re-act on the joiner himself. On the other hand, if they be beautifully done they will be reflected in his work. Surely fine architecture was a difficult thing to define, and there must be different kinds of drawing to reach that end. For example, the same kind would scarcely have been used for the new front of the British Museum as for Professor Lethaby's recent country church in Gloucestershire. It was impossible to imagine a French academic drawing fully expressing the purpose of the latter building. A very clever draughtsman had once said to him that Gothic architecture was not popular because it was difficult to draw.

Mr. J. D. CRACE thought that something might be said about experience as the result of drawings. One of the speakers referred to architecture in the grand manner. There were in existence a number of Wren's designs which, while perfectly expressing his intention, would never pass muster in an ordinary competition nowadays. As a contrast the designs submitted at the time of the competition for the new Admiralty Buildings were unequalled for quality in any

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competition of modern times, and they made quite a sensation. Yet the Admiralty Buildings scarcely beat Wren's work. He believed that an architect in acquiring skill as a fine draughtsman was contributing enormously to his own pleasure; while he was also probably helping himself in his dealings with clients, and was learning to make perfect explanatory notes for the workmen. But he could not think that the proposition "that fine draughtsmanship conduces to fine architecture" held water. Fine draughtsmanship was an excellent thing, but it did not necessarily conduce to fine architecture.

Mr. J. H. MARKHAM said he would like to find out where fine draughtsmanship came in. It was only a question whether drawing helps towards the design or whether it does nothing of the kind.

Mr. H. COE considered the great thing was whether draughtsmanship was to be master or servant. Architecture had been called the mistress art; he personally preferred it being called the mother art. The phrase "mistress art" implied domination. And that is what has now happened. But surely the architect was really the controller of other people. This was the case with Wren. The great buildings of the past were carried out on that principle, and not by a single man who designed the whole thing. Architects had become paper architects; whereas it was only by co-operation that the best results were obtained. The present Renaissance movement had done a lot of harm to architects in so far as they had failed to keep pace with the advance in constructional methods, with the result that much of their work is given to engineers. Many an engineering work has produced a fine æsthetic result, which was itself the result of real construction. It would therefore seem that unless one kept pace with such a thing as reinforced construction one's draughtsmanship was nil. However, draughtsmanship might be said to be of the highest importance.

Mr. THEODORE FYFE considered that Mr. Horsley came to the essence of his subject when he spoke about fine diagrams. The best work was a very fine drawing done in line and full of character; in fact it was a very fine diagram, with everything perfectly shown. There was a need to go back to that method. Designs by the greatest men were really diagrams with a lot of life and character about them. The subject of the debate might be better put as "that fine draughtsmanship conduces to fine appreciation of architecture." The architect should begin with an extremely small scale drawing in charcoal, then with one in fine lines, and end with the full-sized detail.

Mr. C. F. A. VOYSEY said it was very much a matter of temperament how a man got to work. If an architect had his idea complete in his mind he could draw it without spoiling such a lot of paper.

Mr. L. ELKINGTON said that practical draughtsmanship performed a dual service. It acted as a crucible in which the ideas of the architect might be crystallised into the jewels he hoped to construct. That kind of draughtsmanship need not be fine. When the crystallised gems had been produced they should be given a proper setting. They were told not to cast pearls before swine, but at any rate these crystallised gems have to be thrown before assessors. These gems should be of the very best. The other service of fine draughtsmanship is in connection with the workmen's drawings. The first essential of these is that they should truly represent what is in the architect's mind, to a mind not so well informed. Mr. Horsley had taken his place at the winch, and let down the bucket to the bottom where truth was supposed to dwell. No doubt at the end they would put her at the top.

Mr. G. E. NIELD suggested that if the subject had been "that quick draughtsmanship is conducive to good architecture," it might have met with support. Everyone knew how quickly ideas passed through one's mind. The good draughtsman in his hesitation to produce good lines would lose his idea. Under modern conditions it was difficult to do good work in office hours; the best time seemed to be midnight, when most people were asleep. The best who has the ability to express rapidly that which passes through his mind is likely to produce better results than one who always produces fine draughtsmanship.

Mr. D. A. FOSTER briefly emphasised the need of producing drawings which the workman could understand. Anyone who has had to superintend the erection of buildings would know that workmen have often great difficulty in understanding the drawings.

Mr. ARTHUR KEEN, the president, spoke of the danger of a draughtsman being so rapid that he put on paper more quickly than he could design in his head. Assuming that the architect has designed a building, all that he required is to express his ideas to the workmen. But before he does that he must have designed the building. As regards the immediate proposition it seemed to be quite arguable that a fine drawing was a work of art in itself. It possessed many artistic characteristics—beauty of line, studied balance of light and shade, exquisite delicacy of delineation. A man producing those qualities on paper would be thinking also of how he will produce them in his building. From that point of view fine drawing conduced to a fine architectural result.

Mr. HORSLEY, in replying to the many points raised said he had endeavoured in his paper to make it as clear as possible that draughtsmanship was but a humble part of an architect's work. But to argue that the object of fine draughtsmanship was to spoof one's clients and then one's self, was pure rubbish. Mr. Crace had said that drawings might be beautiful, and yet the architecture bad. That was quite true. He had instanced some drawings submitted in competition for the new Admiralty buildings. But was it not possible that if the gentleman who produced them had been entrusted with the work he might have produced a very fine design? One reason, said Mr. Horsley, why he was glad to have an opportunity of writing the paper was that it had been his good fortune to be a pupil of a man who was perhaps the finest architectural draughtsman that England had ever seen. It was impossible to be in that man's office without realising how great a part beautiful drawing played in the architectural life. As the man had practically retired his name might be mentioned, it was Mr. Norman Shaw. It was impossible to see any drawing in the office without feeling that the precision and accuracy and beauty with which that drawing was done contributed to the value of the business. The reason was that the drawing seemed to inspire. Mr. Fyfe had spoken of the drawings by the old Italian masters, of their beauty of line, and the character which they expressed. That was absolutely true. Draughtsmanship only came into use during the past 200 or 300 years. It had to be accepted as a means to an end; it was impossible to get away from it. Mr. Horsley concluded by giving instances of a few great architects who were fine draughtsmen.

Villars de Honnecourt produced beautiful sketch books, the author of the design for the west towers and spires of Cologne Cathedral (made in the fourteenth or fifteenth century). These drawings, on vellum, are exhibited at Cologne. The work was completed twenty years ago from them. Many architects of the sixteenth and seventeenth centuries in Italy, notably Michel Angelo, Antonio da Sangallo, Bramante, Palladio and Vignola. In England in the seventeenth century Inigo Jones and Sir Christopher Wren. In the eighteenth century in Rome lived and drew Piranesi. The "carceri" drawings of this very remarkable artist, representing his ideas of prison architecture, had clearly a very sensible influence upon George Dance the younger, the designer of Newgate Prison. Nearer our own times in the last century we had Elmes, the designer of the St. George's Hall at Liverpool. Cockerell, some of whose drawings were at the present time hanging on the walls of the Royal Institute of British Architects in Conduit Street. George Edmund Street, who had a fine command of the drawing pen, with a character and touch all his own; and, finally, W. Eden Nesfield and R. Norman Shaw, R.A. There was yet another world of fine drawing which had led to the creation of fine architecture. This was the realm of architectural sketching and measuring. Of the masses of sketches which had been made, only those which were drawn with intelligence, so that they were really drawn not only on the sketch block of the artist, but also on his mind, were of value as means of education, not for mere copying and reproduction. In our own times three of our ablest and most distinguished architects were the leading architectural sketchers and measurers, viz., William Burges, W. Eden Nesfield, and Mr. Norman Shaw. What was characteristic and noticeable about all the drawings by the masters he had enumerated was the great delicacy and care, and at the same time the great vigour, which appeared in the line. Further, the perfectly accurate representation of the proportions and "scale" of the object drawn; of the outline and projection of cornices or mouldings. It was not only what these men drew which influenced the work of their lives, but it was also the intelligent and the beautiful way in which they drew. Amongst the fine French draughtsmen are Charles Garnier, Leon Ginain, H. Daumet, Jean Pascal, E. Bénard (who was building the Californian University), Redon, and Chedanne. They were all Grand Prix men.

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Mr. RICARDO also briefly replied.

The PRESIDENT then put the question, with the result that twenty-eight voted in favour of the proposition and thirty-one against.

SOUTH WALES COTTAGE EXHIBITION, SWANSEA.

THE report of the judges on the cottages erected at this exhibition is as follows:—

To the Committee, South Wales Cottage Exhibition.

Ladies and Gentlemen,—In accordance with your invitation to act as judges in the South Wales Cottage Exhibition at Swansea, we have the pleasure to state that we visited the Town Hill Estate on Friday, November 11, and inspected all the cottages in detail.

Before dealing with our awards we should like to congratulate the Swansea Town Council on the exceptional site they own, and to express our appreciation that the first effort at building operations on the estate should have been with a view to improving the dwellings of the people. We are of opinion that the only thing necessary to make the estate popular and ideal is the provision of suitable traffic facilities. With this provision we have no doubt that the town will greatly develop in this direction.

Coming to the Exhibition we regard the standards of planning, elevations and building as marking a distinct advance on previous exhibitions—a notable feature being the look of permanency and the harmonious grouping of the whole.

We have pleasure in making the following awards:—

Class A.—(Maximum Cost 202l.)

Gold Medal.—Exhibits 10, 11 and 12. Cost including builders' profits and architect's fees 195*l.* 6*s.* 8*d.* Architect, Mr. E. C. P. Monson, F.R.I.B.A., London; builders, Messrs. Spencer, Santo & Co., Ltd., London.

Class B.—(Maximum Cost 231l.)

Gold Medals.—Bracketed equal Exhibit 16, Exhibits 5 and 6. Exhibit 16: Cost including builders' profits and architects' fees, 231*l.* Architects, Messrs. Pepler & Allen, Swansea and London; builders, Messrs. Spencer, Santo & Co., Ltd., London. Exhibits 5 and 6: Cost including builders' profits and architect's fees, 231*l.* Architect, Mr. Charles T. Ruthen, Swansea; builders, Messrs. Lloyd Bros., Swansea.

Class C.—(Maximum Cost 260l.)

Gold Medal.—Exhibits 18 and 19. Cost including builders' profits and architect's fees, 259*l.* 17*s.* 6*d.* Architect, Mr. Charles T. Ruthen, Swansea; builders, Messrs. Lloyd Bros., Swansea.

Silver Medal.—Exhibits 2 and 3. Cost including builders' profits and architect's fees, 259*l.* 17*s.* 6*d.* Architect, Mr. Charles T. Ruthen, Swansea; builders, Messrs. Lloyd Bros., Swansea.

Bronze Medal.—Exhibit 14. Cost including builders' profits and architects' fees, 260*l.* Architects, Messrs. Pepler & Allen, Swansea and London; builders, Messrs. Dawson & Jones, Forest Fach, Sheffield and Huddersfield.

Class D.—(Maximum Cost 350l.)

Gold Medal.—Exhibits 8 and 9. Cost including builders' profits and architect's fees, 336*l.* Architect, Mr. P. Morley Horder, F.R.I.B.A., London; builders, Messrs. Spencer, Santo & Co., Ltd., London.

We have made these awards on the clear understanding that the exhibitors are prepared to build twelve more cottages on the Town Hill Estate at the same price if called upon to do so by the Swansea Town Council within a reasonable time.—We are, yours faithfully,

H. BEDFORD TYLOR, Bournville.
GEOFFREY LUCAS, F.R.I.B.A., London.
GEORGE BELL, A.M.I.C.E., Swansea.
W. MILLER, Swansea.

THE Trieste Communal Authorities have, says the *Board of Trade Journal*, arranged with the Institute for Workmen's Dwellings for the erection of thirty-five buildings to contain 1,000 flats for workmen. Two years are allowed for the carrying out of the work, which, it is estimated, will cost about 142,000*l.*

ILLUSTRATIONS.

OXFORD COLLEGE SERIES, BALLIOL.—INTERIOR OF HALL—SCREEN IN HALL.

THE Hall at Balliol College, Oxford, was erected in 1876-7 from the designs of the late Mr. ALFRED WATERHOUSE, R.A. Of recent years it has become apparent that the walls, being largely cut up by windows, did not offer sufficient space for accommodating the large number of portraits of distinguished *alumni* of the College. It became, in fact, necessary to secure more wall space, and it was found that by a simple modification of the design of the windows their sills could be raised without disturbing the proportions. This proposal worked in well with another suggestion that the original low (5 feet) dado should be removed in favour of high panelling more in accordance with the usual traditions of college halls.

A generous donor, Mr. ROBERT YOUNGER, K.C., came forward with the offer of the necessary funds for thus embellishing the hall of his College, and the architectural control was committed to Mr. PAUL WATERHOUSE, who also took his degree from Balliol. Mr. WATERHOUSE'S idea has been, while following in the main the well-known Oxford and Cambridge examples of early seventeenth-century panelling, to retain rather more severity in the classic details than is usual in the Elizabethan and Jacobean models. The richer effects are concentrated at the east and west ends, the side-wall panelling being kept extremely plain and quiet. Its simplicity is only broken by occasional Ionic pilasters and by the fireplaces. These fireplaces are not wholly new, but are built up around and over the original stone fireplaces put in by the architect's father. The monotony of the prevailing oak tone has been broken here and there by the insertion of heraldry. On the west screen, the fireplaces, the roof corbels, and the doorways occur not only the double shield of the College, but also the arms of many Balliol men, mostly of Masters, benefactors, or trustees of benefactions.

To make up for the loss of light caused by the diminution of the windows all the old coloured glass (except the heraldry) has been removed in favour of white glass.

The panelling, which is entirely of English oak without any kind of staining or fumigation, was carried out by Messrs. MARTYN & Co., of Sunningend, Cheltenham, whose carvers and painters have also executed, under the architect, the whole of the heraldry except that in the windows. The new windows, including the releading of old heraldry, were the work of Messrs. WAINWRIGHT & WARING, of Chiswick. Messrs. KNOWLES, of Oxford, were responsible for the masonry alterations of the windows, and the electric-light fittings, electric wiring, and white-metal door fittings were entrusted respectively to Messrs. SPITAL & CLARK, G. W. WATSON & SONS, and JAS. GIBBONS. The heraldic tiles in the fireplaces were modelled and made by Mr. ALFRED WHITEHEAD, and the new firegrates are from Messrs. BRATT, COLBRAN & Co.

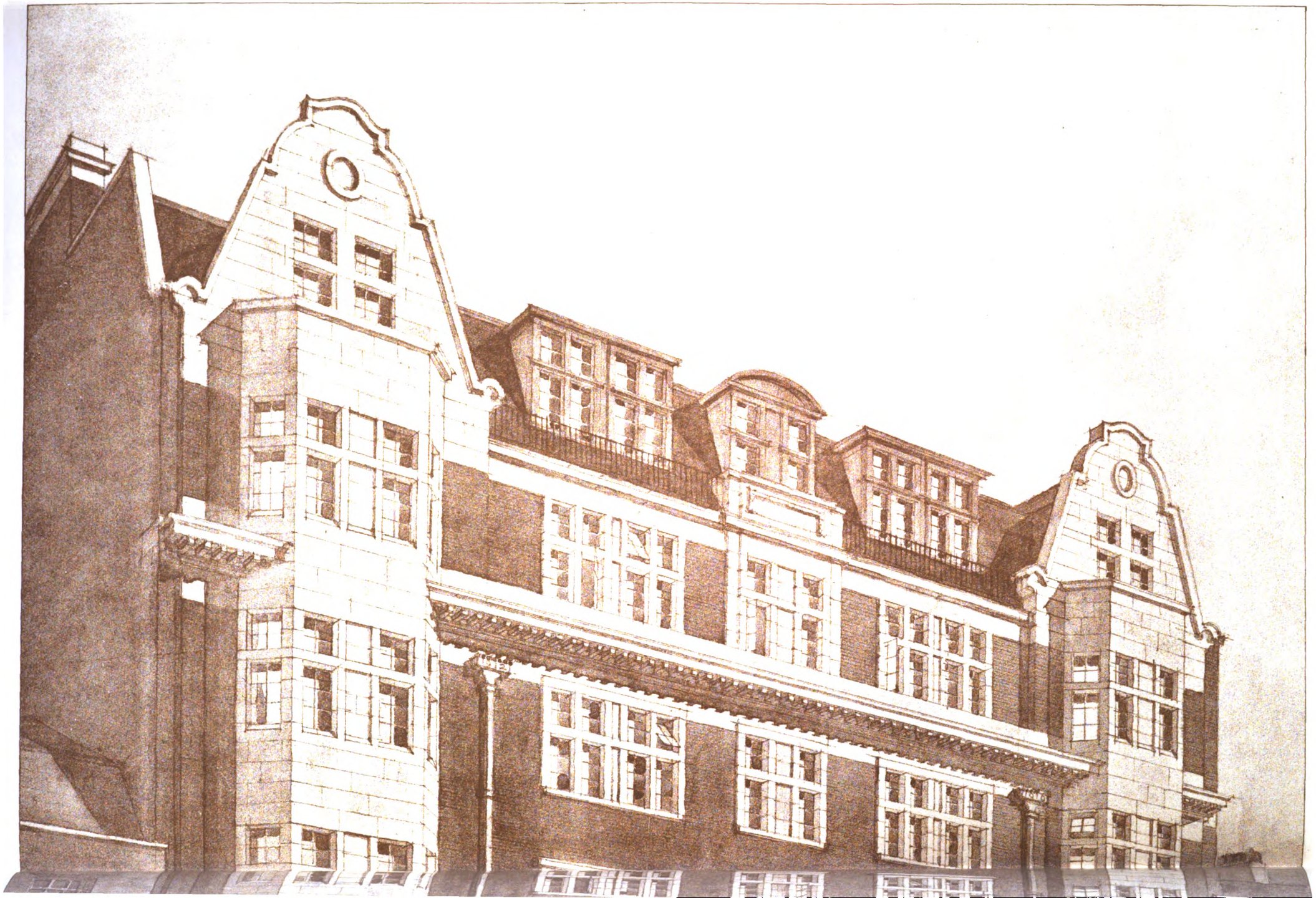
NURSES' HOME FOR THE LONDON HOMŒOPATHIC HOSPITAL, GREAT ORMOND STREET.

THIS home will contain in the basement a recreation room for athletic exercises; on the ground floor, sitting room for sisters, rooms for staff nurses and probationers, and a home sister's office. On the upper floors each sister and nurse will have a separate bedroom, of which there are about seventy, each having adequate sanitary and other accommodation. The design of the home is a quiet domestic Renaissance in harmony with the purpose of the building, and externally will be carried out in red brick with stone dressings. The work is shortly to be started, and tenders have been received. The architect is Mr. EDWIN T. HALL, F.R.I.B.A.

THE Strand Hotel Company have secured from the Crown a site of about 43,000 square feet for a large hotel. The site is off Regent Street, and fronts on Glasshouse Street, Air Street, Brewer Street, and Sherwood Street. Possession will be obtained in 1912.

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NURSES' HOME FOR THE LONDON HOMŒOPATHIC HOSPITAL, GREAT ORMOND STREET, W.C.

Mr. EDWIN T. HALL, F.R.I.B.A., Architect.

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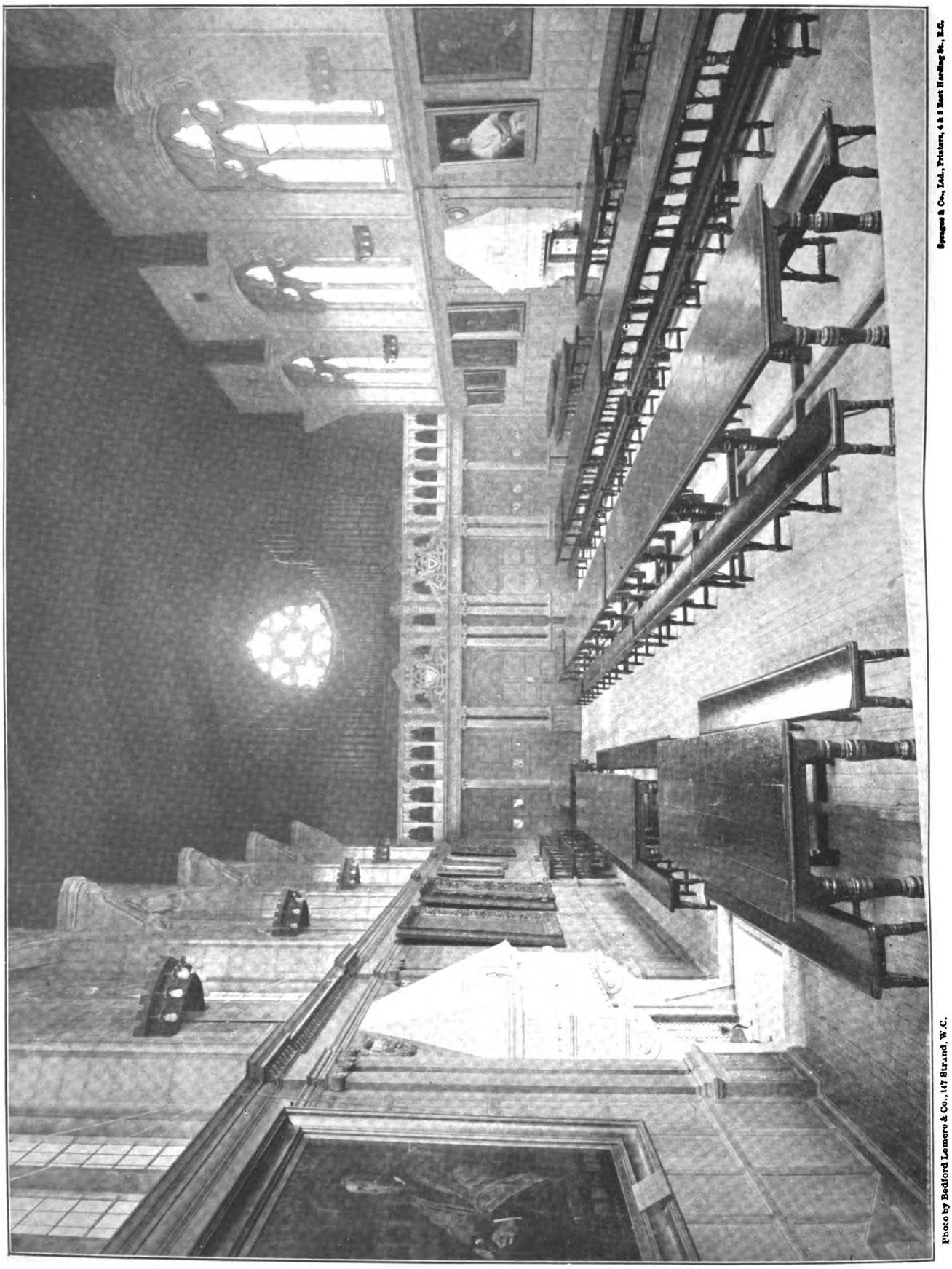
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EXTERIOR OF HALL, BALLIOL COLLEGE, OXFORD.

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Oxford College Series. No 93.—Balliol: Interior of Hall.

Spottiswoode & Co., Ltd., Printers, 54 & 5 New Street Square, E.C.

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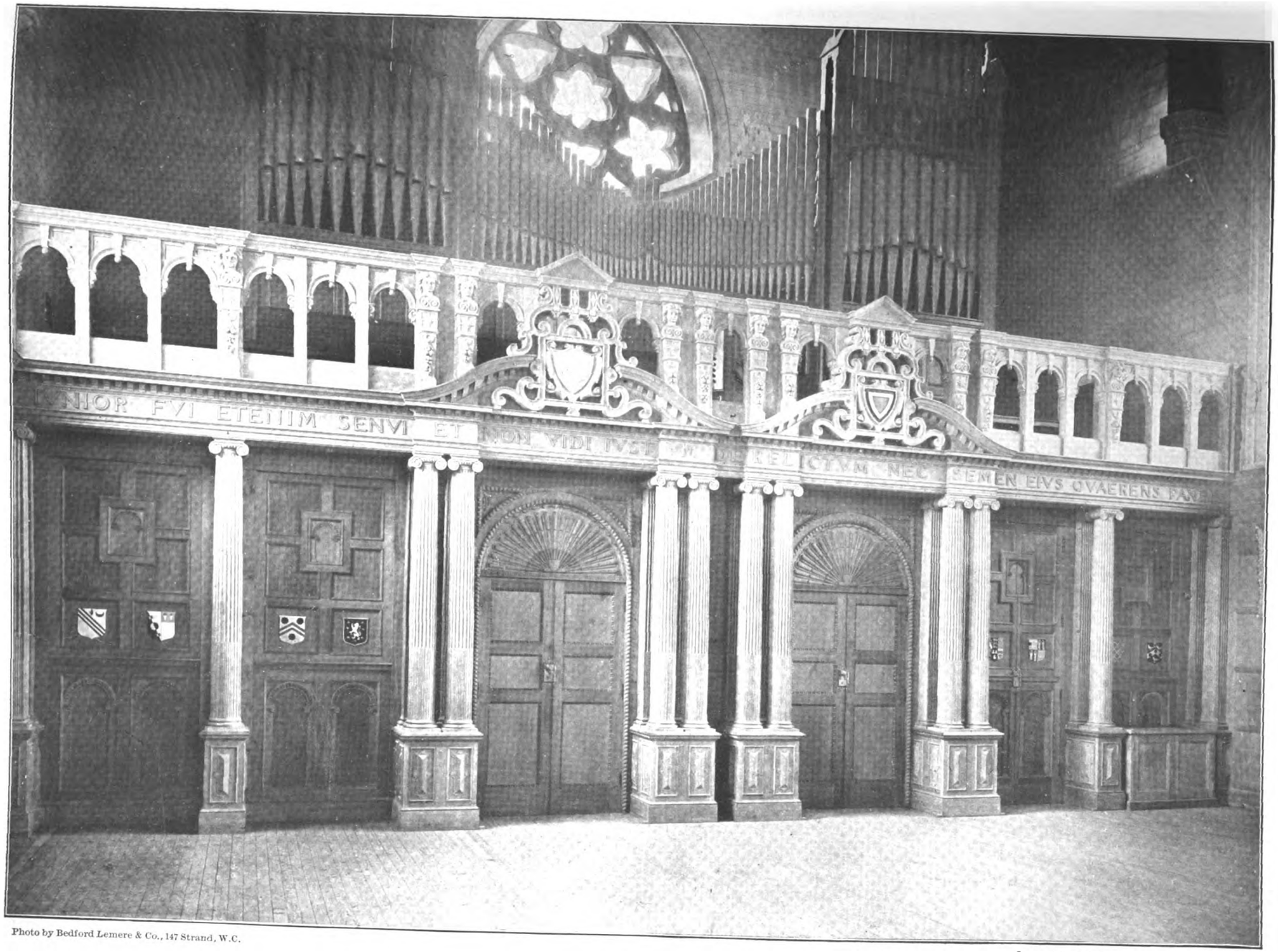


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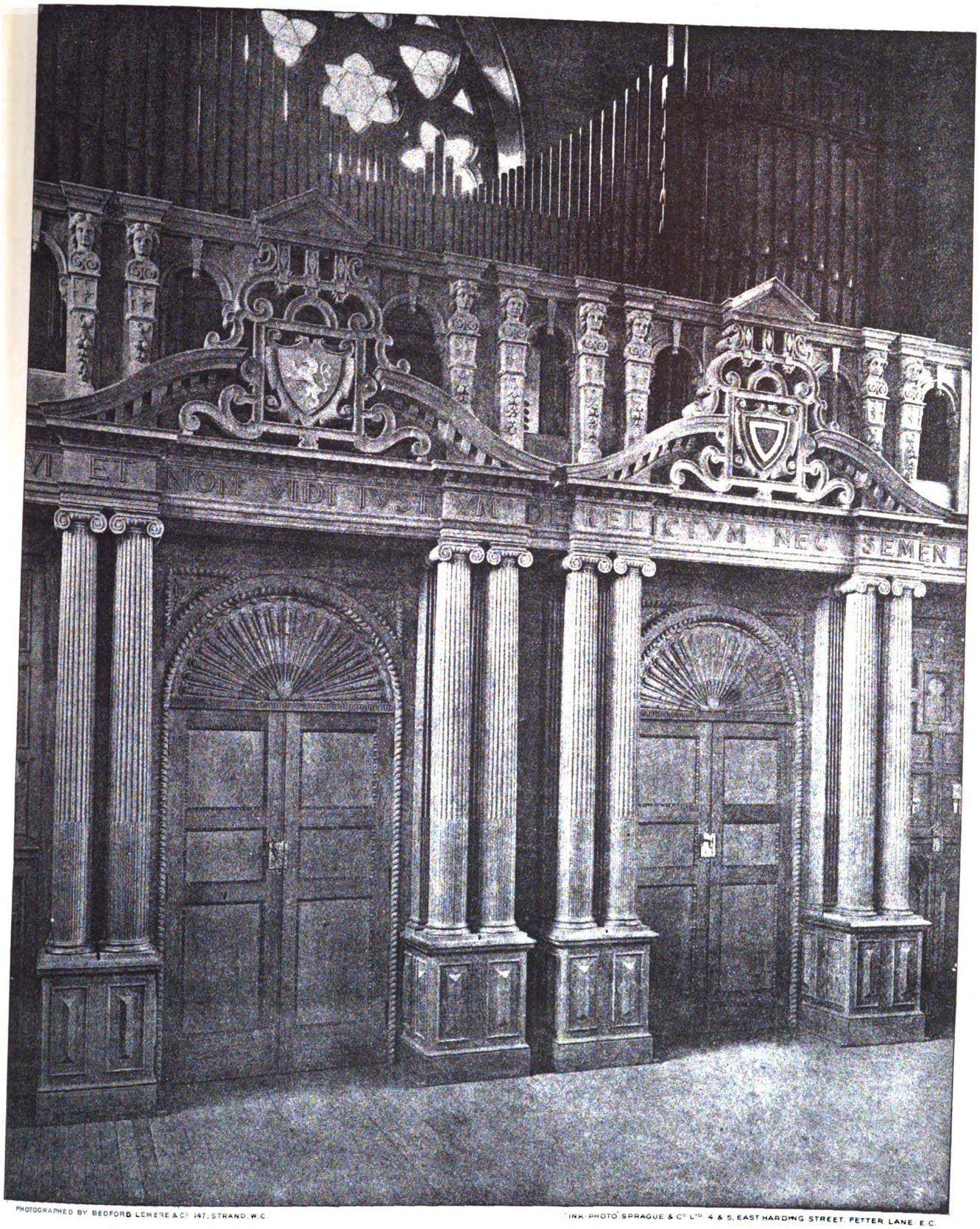
OXFORD COLLEGE SERIES. No. 94.—BALLIOL: SCREEN IN HALL.

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DETAIL OF NEW SCREEN, BALLIOL COLLEGE HALL, OXFORD.

Mr. PAUL WATERHOUSE, M.A., F.R.I.B.A., Architect.

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...SITY
OF
CALIFORNIA

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MODERN COLD STORAGE AND REFRIGERATION.

By W. S. Douglas, B.Sc.

XXII.—ICE-MAKING.

ONE of the most important applications of refrigerating machines lies in the manufacture of artificial ice. For this purpose the evaporating coils of the machine are immersed in a large tank containing calcium chloride brine, which is in continuous circulation round receptacles containing the water to be frozen. Sometimes the brine is cooled in a separate tank forming the ordinary evaporator, whence it is circulated through the ice tank, but as a general rule the above method, which is the more economical of the two, both in first cost and running charges, is the one employed.

There are three principal systems, giving us can, plate and cell ice respectively, but the great majority of existing plants are on the can principle.

Can Ice.

The plan of an ice-making tank on this system is shown in fig. 68. The tank itself is of wrought-iron plate about ¼ inch thick (although it may be made of concrete or even of wood) and is thickly insulated in the same way as a cold room, silicate cotton, granulated cork, or charcoal being all suitable materials to use as packing. The packing material is laid right up against the tank, separated only from it by waterproof paper, and is packed between battens of the necessary depth (from 8 to 12 inches). Finally it is sheeted in with matchboarding.

A partition, also of wrought-iron plate, divides the tank into two portions, in one of which are placed the evaporating coils of the refrigerating system, and in the other a timber framing (which should be well creosoted) supporting a number of oblong galvanized steel vessels. These, known as "cans" or "moulds," contain the water to be frozen, and are made of smaller section at the bottom than at the top in order to allow the ice when formed to slide out easily. In the diaphragm a large circular hole is cut, and a propeller revolving in this circulates the brine from one division of the tank to the other; or instead a circulating pump may be used, sucking the brine from the tank at the bottom of one side and returning it at the top of the other.

Connected to the expansion coils in the ordinary way are the two other units of the system, the compressor and the condenser. From the latter the liquid refrigerant spurts through the expansion valve into the coils, in the windings of which it gradually evaporates. As a vapour it is then sucked back to the compressor, and is re-compressed up to the condenser pressure, which corresponds to the cooling water temperature prevailing. Everything, in fact, is arranged in the usual way, with the exception that the expansion coils, instead of being located in a cold room or in an air-cooler, as we have seen them hitherto, are immersed in the brine of the ice tank. In this case they are in a separate compartment from the moulds, but often they are wound in and out of these, circulation being effected by a pump.

Varying sizes are used for the moulds, from 28 lb. up to 4 cwt., different thicknesses being used in each case. With smaller moulds, of course, a large number must be used to make up the necessary capacity; but, on the other hand, with larger moulds the time taken to freeze is longer, and, if more than 24 hours, a tank of greater capacity than the daily output of the machine must be provided; so that the most economical size of mould would seem to be the largest which can be frozen, allowing time for filling and emptying the cans, in 24 hours. This is about 1½ cwt. But in any case the final decision depends on the requirements of the ice-manufacturer's customers.

To reduce the time of freezing with thick ice (and consequently lessen the size of tank) the water to be frozen is usually passed through a fore-cooler before entering the moulds. This apparatus consists simply of a galvanized tank, through which the suction line from the expansion coils passes on its way to the compressor. In it the temperature

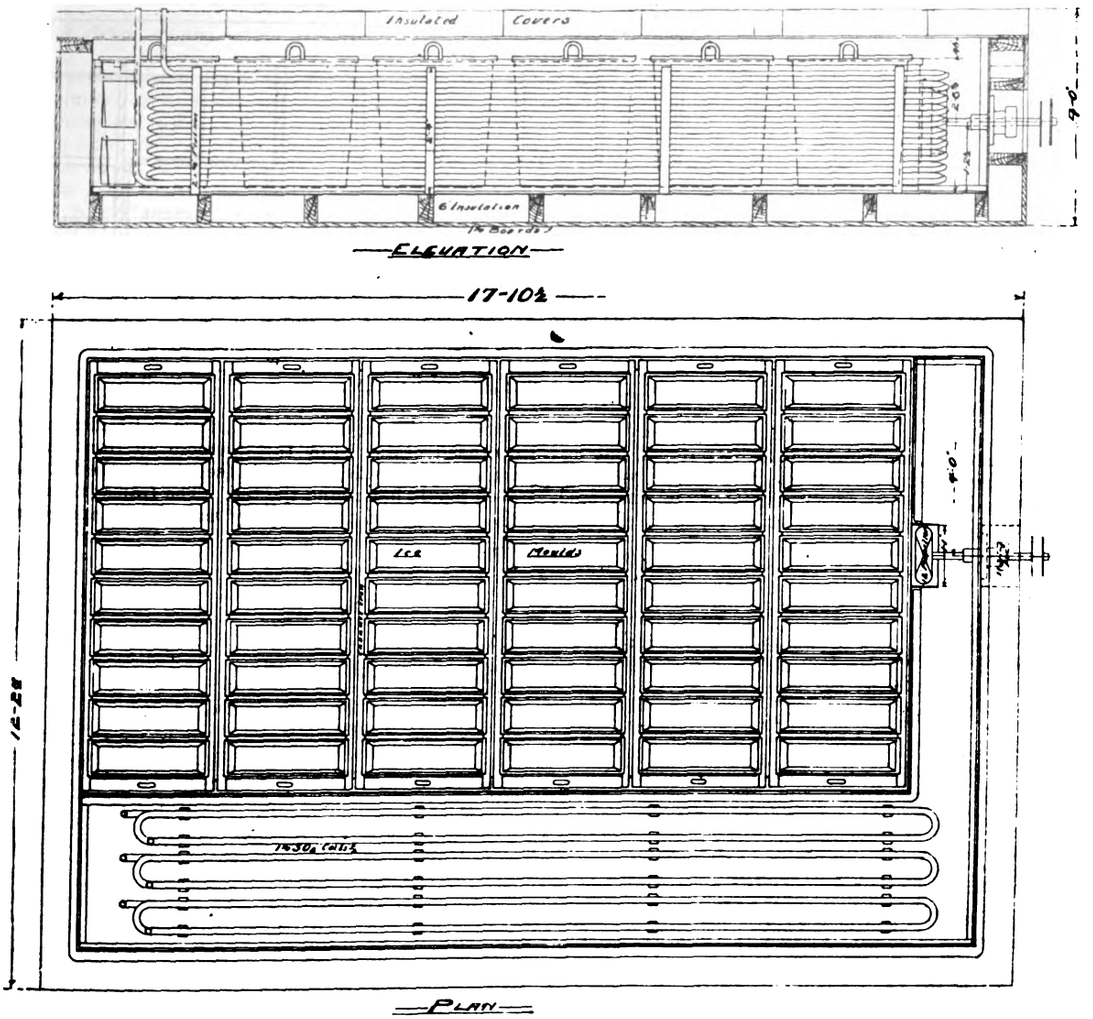


Fig. 68.—THREE-TON ICE-MAKING TANK WITH ONE CWT. MOULDS.

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of the water is reduced to nearly freezing-point, so that only the actual freezing has to be done in the ice tank.

The time of freezing also depends on the temperature of the brine. Lower temperatures bring about quicker freezing, but the ice produced is liable to be rotten and of bad keeping quality. Also, a lower back pressure must be maintained in the expansion coils, with the result that the capacity of the compressor is reduced (the same volume is pumped but less weight, since the density of the gas diminishes with the temperature) and the horse-power absorbed is increased. 18° Fahr. brine gives very good ice, although 15° Fahr. may be used without much risk. At the former temperature the times of freezing are as follows:—

Thickness.	Hours.
3 inches	6
4 ,,	9
6 ,,	18
8 ,,	32

Thus with 8-inch ice the capacity of the tank, allowing for filling, emptying, &c., must be nearly 1½ times the rated daily output of the machine.

In the case of the tank in our illustration each can is made to contain 112 lbs., and the sixty together have a capacity of three tons. The moulds are arranged in six rows of ten each, and one row at a time is lifted complete by the overhead crane. For this purpose an iron frame is fitted round the moulds, gripping them under the flat band which each mould has round the top. The frame is suspended from the carriage of the crane by two chains and remains horizontal as it is raised. The crane itself is of the simplest construction, is worked by hand, and runs on two rolled-steel joists supported on cast-iron columns. By its agency the moulds, when they have left the ice tank, are moved along until they are over an oblong wrought-iron tank at one end, which is of sufficient capacity to contain them all at once, and which is connected to a hot-water supply. The action

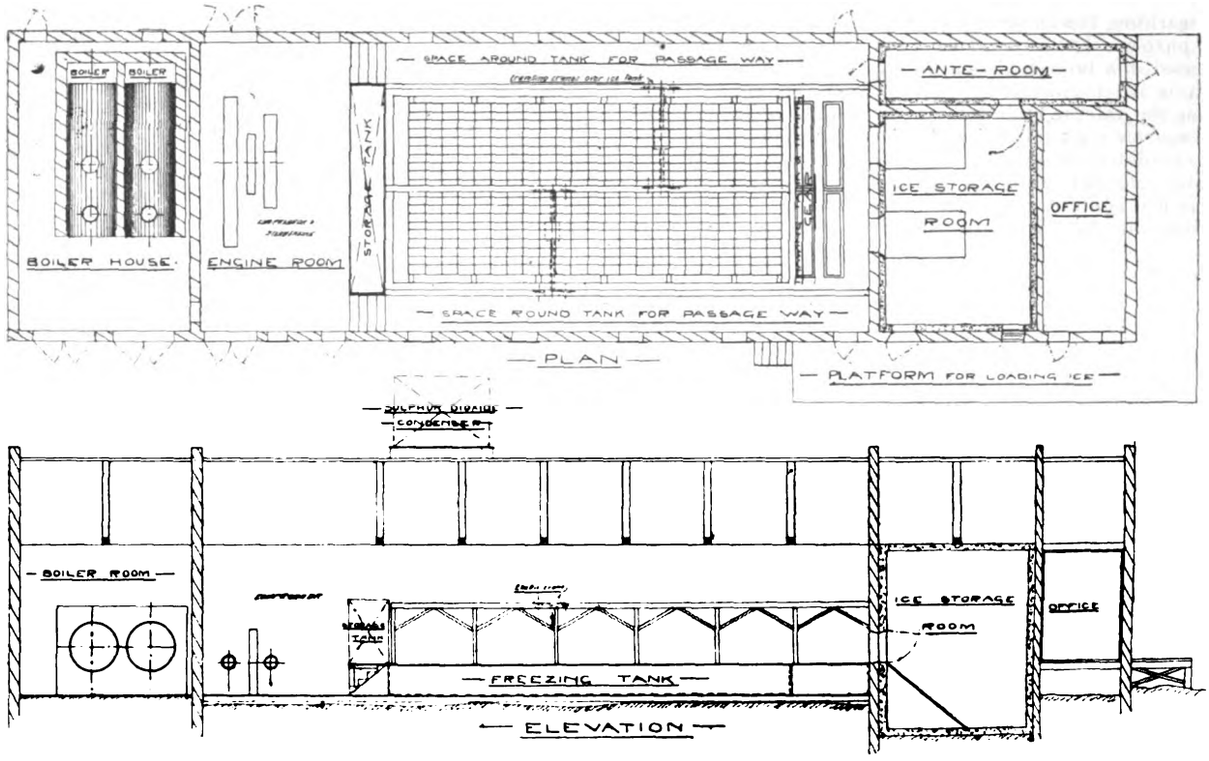


FIG. 69.—SIXTY-TON ICE-MAKING PLANT.

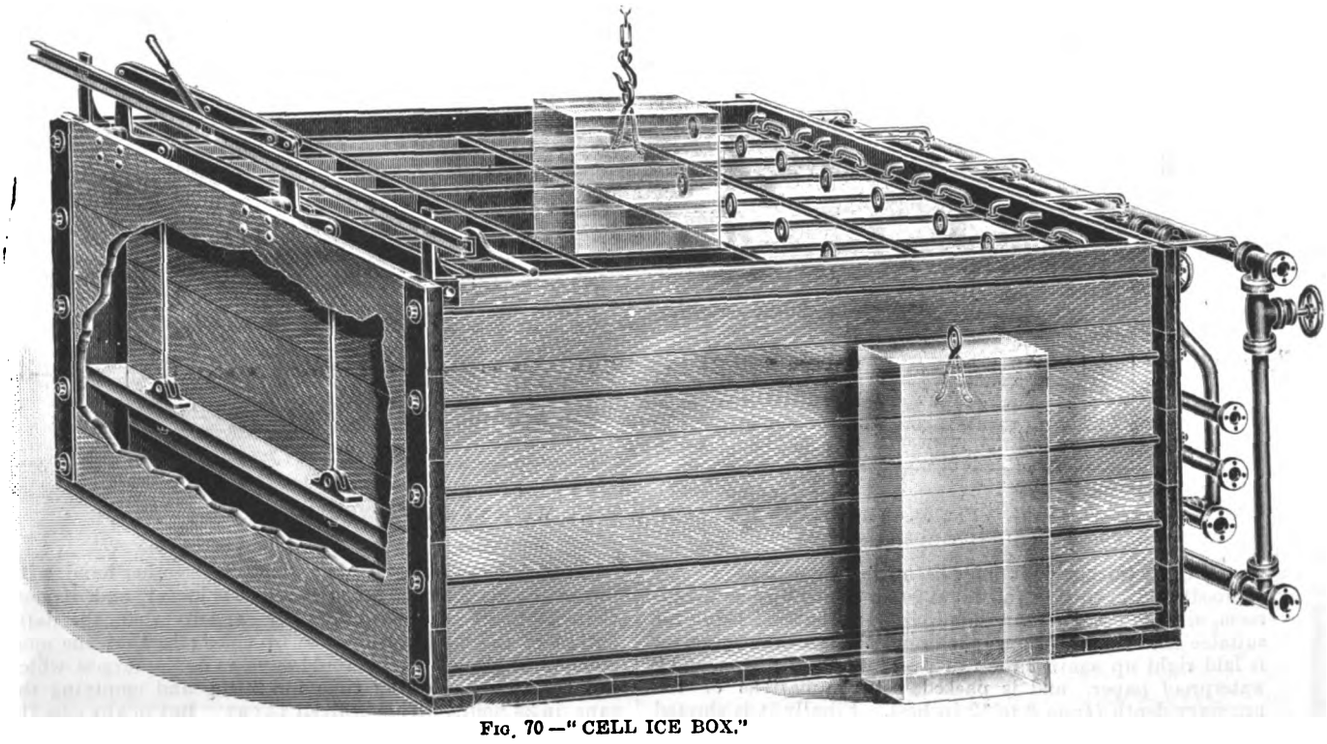


FIG. 70.—"CELL ICE BOX."

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of the hot water just melts the ice at the edge of the cans, and consequently, when the row of moulds is deposited in the tipping cradle, detached from the crane and turned over, the blocks of ice slide out and down the slope in front.

The essential parts of a large plant of about 60 tons daily output are shown in fig. 69. Included are a boiler room, steam-driven compressor, ice tanks, thawing tanks, ice store, air lock, and office and loading platform where the ice is placed in the vans. Two power cranes convey the blocks to the thawing tanks, and from the tipping cradles they slide direct into the store. Nine blocks are lifted at one time from each tank, and as they are lifted out from the end next the store all the moulds in the tank are pushed forward by gearing, so that the space vacated would be filled up and a similar space created at the engine end of the tank. Into this space the moulds are dropped when they have been emptied of their ice blocks, and they are finally filled from the water-storage tank in readiness to produce in due time another nine blocks of ice.

For the sake of clearness no feed-pumps or condenser plant are shown in the illustration, but the following would be necessary:—

Condenser for steam engine with air and circulating pump.

Feed-pumps, preferably in duplicate, for boilers.

Circulating pump for sulphur dioxide condenser.

Many accessories are used in connection with can ice plants, including filling devices which discharge just enough water at one time to fill one can, sprinklers to replace the thawing tanks, &c., but space does not permit of a detailed description. On general lines, however, can-ice plants are very similar, and the arrangement is not greatly affected by the size, which may extend to some two or three hundred tons output per day.

Plate Ice.

In plate-ice plants the tank is divided into a number of partitions by hollow walls. Each division is thus the full width of the tank (which may be anything between 8 and 14 feet) and the full depth, which will be between 6 and 10 feet, according to the weight of the plate. The space left between the walls for the water to be frozen is from 18 to 30 inches.

The hollow walls are only 2 or 3 inches apart, and are either all connected to a common distributing box for brine circulation, or else have the evaporating coils of the freezing machine located inside them. On either system the surface of the walls becomes very cold and ice rapidly forms, extending, with gradually decreasing rate of formation, until a plate from 8 to 14 inches thick, according to the width of the division, has accumulated. Hot brine or hot refrigerant (ammonia or sulphur dioxide, as the case may be) is then turned on to replace the cold medium which has been circulating through the walls or coils, and the edge of the plate is rapidly melted. This detaches it from the wall of the division, so that it can be sawn up with special tools and lifted out in blocks of any size.

The plates, needless to say, are of great weight. For a tank 10 by 14 feet, for instance, and a thickness of 12 inches, the weight would be 3½ tons. Freezing is also a slow process, the time varying from seven to fourteen days, according to thickness. Consequently the plant is expensive in first cost, as a tank of from seven to fourteen times the daily capacity of the machine must be put in. The attendance and upkeep charges are also usually greater, but on the other hand clear ice can be produced without distilling the water (as explained in another section of this article).

For the latter purpose agitating paddles in the centre of each division are provided, rocked by suitable gear. Freezing can be carried out to within ¼ inch of the paddles on each side.

Cell Ice.

Cell-ice tanks are very similar to those used for plate ice. The difference is that each division of the tank, instead of extending to the full width, is sub-divided into separate cells by cross walls, which, like the main walls, are hollow. In addition the tank is fitted with a false bottom, so that the blocks of ice when formed extend only to within 6 inches of the bottom of the tank. The false bottom is connected to a division at the side of the tank (seen at the left of fig. 70), in which agitating paddles work and cause the water to be in continual motion between the cells and the division through the perforated bottom. Consequently the air bubbles and impurities, which, as explained below, cause opaque ice, are washed away and fairly clear ice is produced, although the product has not quite the same transparency as that obtained from plate ice plants.

Cold brine is circulated in the hollow walls from the evaporator of the freezing machine, and when freezing is complete is replaced by warm brine, which thaws the edges of the ice blocks and allows them to be lifted out by means of a rope or hook which has been frozen in. The double connections for this purpose are seen at the right of fig. 71. Usually the blocks are from 8 to 12 inches thick, and weigh from 4 cwt. upwards. As in plate plants, the ice tank must be several times bigger than the daily capacity of the machine owing to the time taken to freeze.

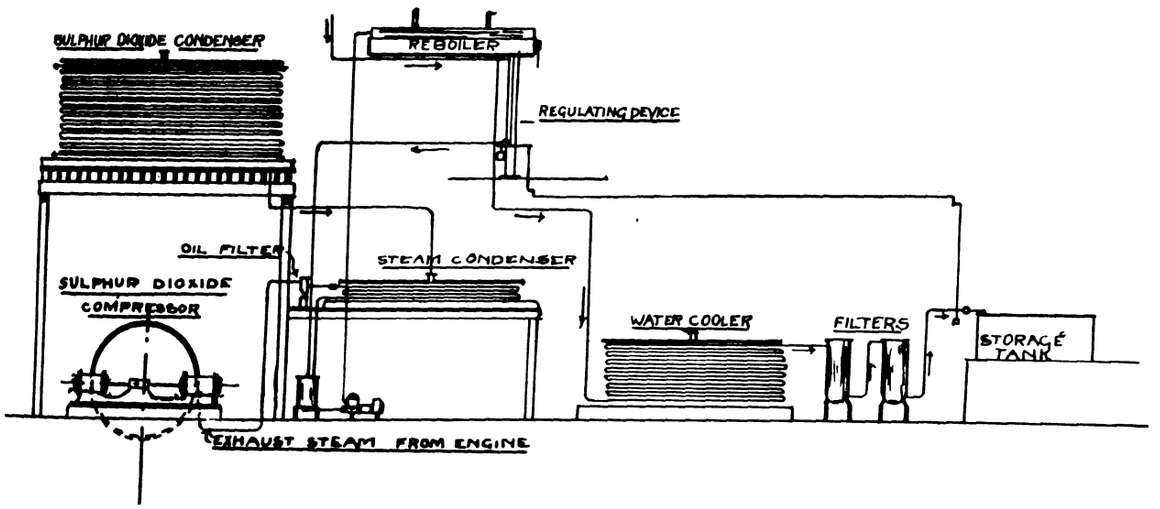


FIG. 71.—DIAGRAM OF DISTILLED ICE-PLANT.

Clear Ice.

Can-ice, when formed in the ordinary way, is of an opaque white appearance, due partly to the impurities in the water, and partly to the air bubbles held in solution, which become imprisoned in the ice and form reflecting surfaces to the light. For cooling ice chambers and shop purposes such ice is good enough, but for table purposes and consumption clear ice is necessary. It can be produced on the plate system by simply agitating the water either by circulation with agitating paddles or by injection of compressed air. The effect of this is to drive out the air bubbles, and the impurities do not enter into the question, since it fortunately happens that when a mass of water is frozen from both sides only the pure water turns to ice at first, the impurities collecting in a solution, becoming gradually denser in the centre of the division. All that has to be done, then, to prevent their getting into the ice is to stop the freezing process before the central core is solidified. This is always done, as we have seen, in the plate system, and in cell plants there is no need for it, as the impurities are washed into the false bottom. At the same time it is better, even in the cell system, not to allow the central core to be solidified unless the water has been distilled.

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With can plant, however, agitation alone is not sufficient to produce perfect ice. It is frequently employed either in the form of compressed air or mechanical movement, but the ice produced is never more than partially clear. This is due to the central core containing the impurities being frozen, and also to the fact that the agitation never quite rids the water of the air contained by it in solution.

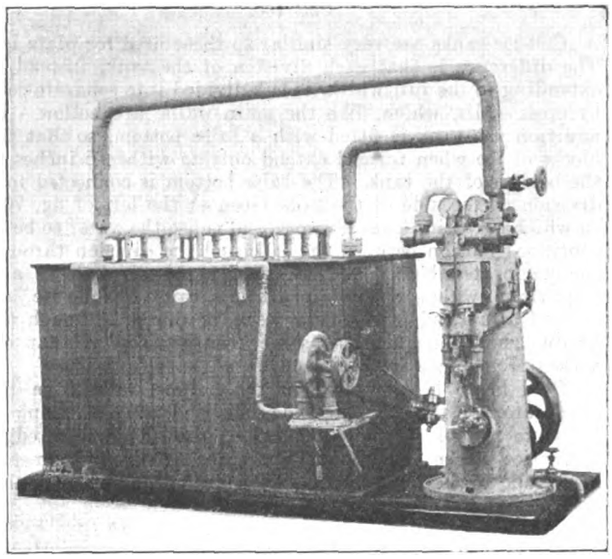


FIG. 72.—SMALL SULPHUR-DIOXIDE ICE PLANT, FITTED WITH CLEAR-ICE GEAR.

Mechanical agitation is effected by paddles or stirrers immersed in each mould, which are kept in continuous motion by suitable gear. The apparatus, however, is noisy and is awkward to remove when freezing is nearly complete. It also absorbs considerable power. Consequently, compressed air is now more commonly used, and various systems have been devised, some involving a continuous flow of air, others an alternate flow and cessation. Among the former one of the simplest consists essentially of rubber tubes carried down to the bottom of each can with free ends. The air issues forth from these at a moderate pressure, and the ends dart about in all directions, distributing the air uniformly to the different parts of the can. On the other system a pump without valves is used. It is connected to glass bottles supported over each can and having underneath nozzles, the openings of which, covered by rubber balls, are closed and opened alternately under the influence of the pressure and suction of the pump. The balls then rise and fall continuously, and the water in the cans is subjected to varying pressures in each direction, the result of which is to drive out most of the air bubbles. Gear of this type is fitted to the small country-house plant shown in fig. 73. The air pump, driven by belt from the compressor shaft, and the connecting pipes are clearly seen.

In other forms of the same gear the pump is differential—*i.e.* the delivery stroke is made twice as rapidly as the return. This is supposed to give a sharper jerk to the air.

But none of the above systems is perfect. If absolutely transparent ice is desired the water must be distilled before entering the cans, and this, unfortunately, involves rather expensive apparatus. Usually with large ice plants motive power is supplied by a steam-engine and boilers, and we can then, by first subjecting it to purifying and de-aërating processes, utilise the exhaust steam from the engine. Otherwise special distilling apparatus, single, double, or triple effect, according to size, must be put in.

Fig. 71 shows in diagrammatic form the arrangement of the plant when exhaust steam is used. The steam passes by way of an oil filter (to remove grease, &c.) from the engine driving the compressor (seen on the left) to a condenser of the surface evaporative type, which is served by the cooling water already used in the condenser of the refrigerating system.

Leaving this apparatus, the water formed is pumped by the pump A to a reboiler consisting simply of a wrought-iron closed vessel fitted with live steam coils, which are connected to the boiler and are of sufficient surface area to cause violent ebullition of the condensed water. In this way the air contained in solution is removed, and the impurities, such as grease and oil, rise to the surface of the water and flow off down a pipe specially provided for the purpose. The purified and de-aërated water (now fit for making into clear ice) next flows through a cooler over the outside of which water trickles continuously. This water may afterwards be used in the other condensers. Its effect on the distilled water coming from the reboiler is to reduce its temperature to within some 5° or 10° of its own. The pure water then passes through charcoal filters to a storage tank located above the ice-making tank, in which its temperature is further reduced by expansion coils connected to the refrigerating system. The storage tank is well insulated, and is connected to a special can filler by means of which the water is passed into the cans without being allowed to

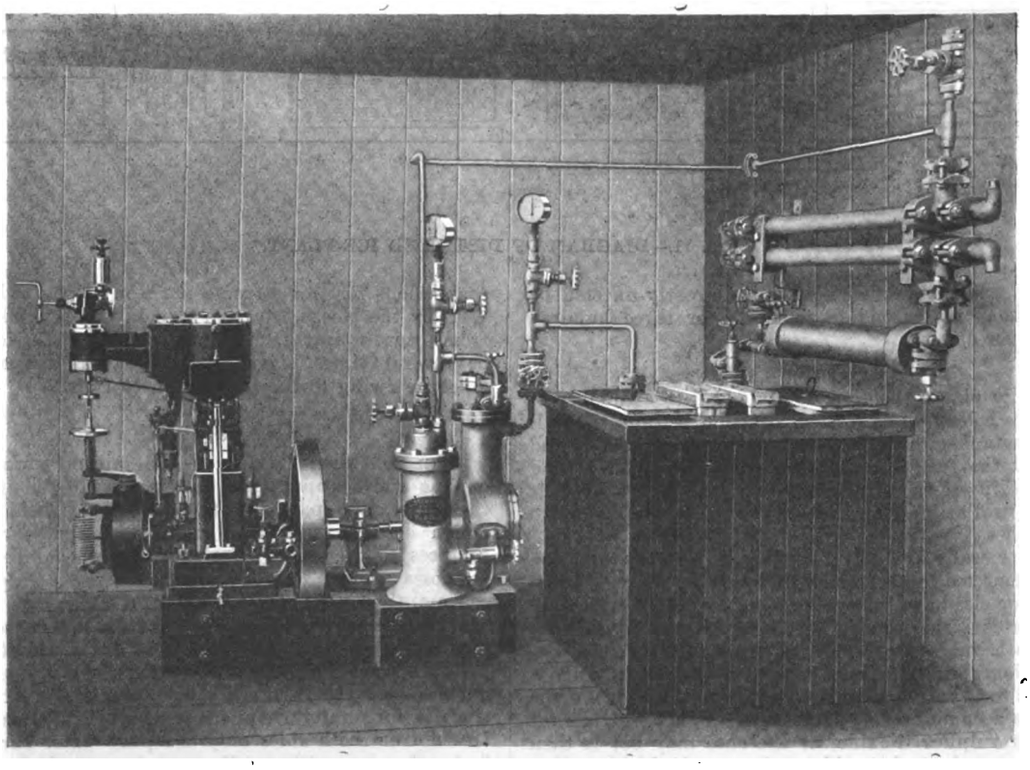


FIG. 73.—SMALL AMMONIA ICE-PLANT WITH STEAM DRIVEN COMPRESSOR.

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absorb any air into solution. This simply consists of a device for allowing the water to flow into the bottom of the ice mould and rise upwards.

Sometimes an extra filter of the sponge type, if the nature of the impurities warrants it, is interposed between the storage tank and the cans; and another improvement frequently adopted is to place a heater between the engine and the condenser, so that the steam coming from the engine may come into contact with the feed water going to the boiler, thus cooling itself and heating the water. The re-boiler may also be aided by a separate skimming vessel to remove the scum, and, in any case, a regulating device is fitted to keep the level of the water at just that height which allows the impurities to be drawn off through the overflow.

Small Ice-making Plants.

Small plants are very useful for country houses, hotels, restaurants, up-country stations, &c., and two different types are illustrated in figs. 72 and 73. In the first a tank of 1½-cwt. capacity, connected to a submerged condenser and compressor, by Messrs. Wm. Douglas & Sons, Ltd., is illustrated. The whole is mounted on a combined bedplate, which enables the pipe connections to be completed in the makers' workshops. In this case the refrigerant used is sulphur dioxide, which enables the plant to operate without unduly diminishing efficiency in tropical climates. The tank contains six moulds, capacity 28 lb. each, and is fitted with clear-ice gear on the compressed-air principle. Prominent in front will be noticed the air agitator and connections to the glass bottles above each mould. The drive, which is not shown, is by belt from any convenient form of motive power—oil, steam, gas, or electric, as the case may be.

The second plant uses ammonia as a refrigerant, and is made by Messrs. L. Sterne & Co., Ltd. An enclosed compressor is used direct coupled to a high-speed engine, and the ice tank in this instance is fitted for ordinary opaque ice only. In front of the compressor will be noticed the large oil separator used with ammonia machines, and the neat double pipe condenser will be observed fixed to the wall above the ice tank. Below it is the ammonia receiver, from which the liquid refrigerant passes through the expansion valve to the evaporating coils inside the tank.

Small plants of this nature are comparatively inexpensive, and by their aid ice can be produced at low cost in places where it might be otherwise unattainable.

ENGLISH DOMESTIC WORK.—IV.

THE fourth of the course of eight illustrated public lectures by Mr. J. A. Gotch, F.S.A., F.R.I.B.A., at University College, Gower Street, W.C., on the above subject dealt with

The Homes of Queen Elizabeth's Courtiers—Exteriors.

When the desire for better homes was at its height, said Mr. Gotch, there came the momentous epoch of the Dissolution of the Monasteries. The desire for improvement had then become augmented from within and without—from within by the change of ideas as to household arrangement, and from without by the sight of what was being done in foreign lands. The Dissolution of the Monasteries put the large Church revenues into secular hands. The desire for better homes and the means of gratifying it being thus present together, it only wanted the tranquillity afforded by Elizabeth's strong rule to set people building all over the land. The rage for bricks and mortar became universal. Almost every manor house in the country was either enlarged or rebuilt, while some of the principal nobles erected vast palaces worthy, as they somewhat doubtfully hoped, of the most resplendent majesty of the Queen, but which their less magnificent successors have found a great deal too large, and which they have either partly pulled down or else have entirely abandoned for less magnificent but more comfortable homes. Almost every English village shows work dating between 1560 and 1620. Many houses were entirely new, many old houses were enlarged; in some cases houses not fifty years old were replaced by finer ones.

Italian influence (as was shown is the preceeding lecture) at first only affected the superficial ornament. But in course of time the influence became stronger and more and more fashionable. Young men went abroad to study Italian architecture, and on their return offered their learning and experience to wealthy patrons about to build. But it was impossible to all at once Italianise English craftsmen. Consequently the work of the period had a flavour peculiar to itself. The Elizabethan style was unique from the manner in which English workmen used Italian features on English soil, and carried into the Classic forms brought from abroad some of the Gothic ideas which they acquired at home in their youth. They retained the bay windows, the steep gables, the lofty chimneys, with which their fathers were familiar, and they developed the mullioned window until it became an essential characteristic of their work. All these features were marshalled into symmetrical order; they were adorned with Italian details curiously altered in their journey across the Continent. Isolated features, such as doorways and porches, were wrought directly after Italian models, and in the larger houses the Italian loggia or open arcade was frequently introduced, as at Apethorpe, where it is now filled in on account of the English inclement climate. All this Italian dress was put on a body entirely English—namely, the plan of the house. An interesting result was bound to follow. On the one hand, old customs and established wants to satisfy; on the other, new forms and new methods of expression quite different from anything that tradition could supply.

The houses built in Elizabeth's and James's time mark an era in house-planning. There was no longer need for special precautions against attack. There was a great desire for magnificence, for privacy, and for more light. All these requirements were fulfilled. The old type of plan, evolved from the less fortified manor houses, was still further developed. Magnificence was obtained by symmetrical arrangement, by a vast extent of buildings placed round several courts, by a lavish use of gables and turrets and ornamental chimneys, by broad terraces and wide flights of steps. Privacy was obtained by increasing the family rooms on one side of the house and the servants' on the other. More light was easily obtained by providing a multitude of windows—so many, indeed, that Lord Bacon protested against them, saying that one could not tell "where to become, to be out of the sun or cold."

Another characteristic quality was pedantic quaintness. Sometimes it took the form of curious inscriptions written or carved outside and inside of the house; sometimes it showed itself in the form of allegories, and sometimes it affected the very form of the buildings themselves. The most remarkable examples are to be found in two small buildings erected by Sir Thomas Tresham, an ardent Roman Catholic. One of these is triangular on plan and is emblematic throughout of the Trinity; the other is a Greek cross on plan and sets forth the doctrine of the Passion. There is also a plan drawn by John Thorpe, the surveyor, in the form of his initials, "I. T.," to which he has appended the versicle:—

"These two letters, I and T,
Joined together as you see,
Is meant for a dwellinghouse for me,
JOHN THORPE."

In the Thorpe collection of drawings (now preserved in the Soane Museum) are the plans of many of the best-known houses of the time, as well as many plans entirely fanciful. There are triangular houses, and six-sided houses, and squares, and crosses in circles, and many other curious devices.

In Elizabeth's days there were certain simple arrangements which occurred in every house, large or small. In the first place, there was the great hall, no longer a sleeping-place for the whole family, but still the common ground upon which the family and the servants met, and it generally both divides and connects the family rooms and those occupied by the servants. At one end of the hall is the screen, forming an entrance passage, on the other side of which are the buttery and passage leading to the kitchens and servants' offices. At the end of the hall, opposite to the screen, is the dais, and from this end the family apartments would be reached, as well as the main staircase to the upper floor, where the great chamber was situated, and also the characteristic long gallery. In the large houses the rooms were frequently formed in groups communicating with each other, so that each distinguished visitor could have a suite of apartments to himself and his retinue. These were frequently arranged round a courtyard; consequently, although the occupants often had to pass into the open air in order to get to the rooms devoted to common use, yet they were able to follow their own devices without let or hindrance, and to go in and out without observation. This arrangement exists still in the colleges of Oxford and Cambridge, which, indeed, were planned on much the same lines as the large houses of the time.

One thing, perhaps, above all makes itself felt in investi-

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gating these houses—they were built for the descendants of the builder. This fact is proclaimed at every turn. The family arms are always conspicuous; the family badge occurs by way of ornament in all sorts of places. It is clear that the possibility of a change of hands was never contemplated.

The methods of treating the immediate surroundings of the houses of this period were stately and formal. The hand of the owner frankly showed itself everywhere, from the time you entered his domains up to the time when you knocked at his porch door. The house was the centre of a large symmetrically arranged area. If there were a park, an avenue conducted you across it to the first of the regular outworks in the shape of a porter's lodge or an archway. Through this you passed into one, two, or even three courts before you came to the portal of the house itself. The mansion was linked to the garden by definite, obvious, artificial means—by stone terraces and flights of steps, by walls treated in an architectural manner, by quaint garden houses, and by a formal but stately disposition of the ground. In the gardens, the walls and the statues and the fountains made an easy transition to the clipped trees, which in their turn led gradually to the trees of the park outside.

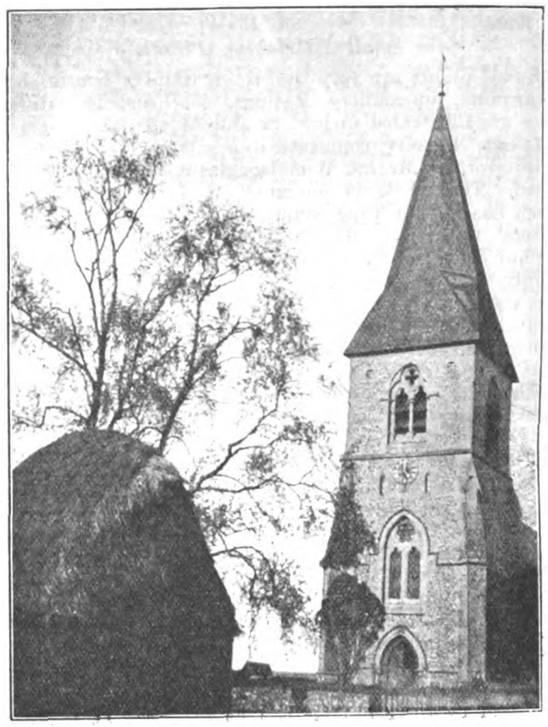
Another feature with which the great men of Elizabeth's days loved to adorn their neighbourhood—either as an incident in their own lay-out or as a conspicuous feature in the adjacent village—was a hospital or almshouse. Sometimes these pious foundations may have been a sop to Cerberus; but more frequently we may well believe that they were the fruits of real piety. They were something to take the place of the charitable institutions which in former days the great monasteries maintained—those monasteries of which the conspicuous men of Elizabeth's days not infrequently enjoyed the revenues. But whatever the motive which led to their erection, these little almshouses, where poor retainers ended their days in peace and comfort, were generally adorned (though on a smaller scale) in much the same way as the great houses which gave them birth. One such place was built by the Montagues of Boughton just outside their park, and on it is inscribed:—

"Time flows by, and we grow old with the silent years."

WALTON-ON-THE-HILL AND HEADLEY.*

THE Church of St. Peter, Walton-on-the-Hill, is a modern edifice, erected in 1818-1820, with further enlargement in 1870-1875. The original building was Norman, as may be seen from the Romanesque arch still remaining and the circular leaden font of late Norman character with rich mouldings and ornaments. The Manor House is a building of unique interest, and Mr. Stebbing, whose careful studies of the whole village are beyond all praise, considers that the old mouldings and other work indicate a date not later than the year 1280. He suggests that the builder would be John de Lovetot, one of Edward I.'s judges, who died in 1295. The owner in 1377 happened to be a younger son of Richard Fitz Alan, Earl of Arundel, and a great-nephew of John, Earl of Warenne. The first references to the Manor date back to a period before the Conquest, but little more than the names of the owners is given. It appears to have been held both by Katherine of Aragon and Anne of Cleves. Sir Nicholas Carew, of Beddington, once a great favourite of Henry VIII., became involved in a conspiracy to place Cardinal Pole on the throne; for this he was tried and beheaded. In Queen Mary's reign, as the family had remained Romanist, the Manor was taken from Anne of Cleves and bestowed by Queen Mary on the son of Sir Nicholas, and it remained in the family to the end, though not always inhabited by them. The chapel of the Manor House measured 24 feet by 14 feet, and traces of its window openings with their mouldings remain. Brayley says that it possessed a stone pulpit, which was removed when the apartment was fitted up as a parlour about 1785, while Sir Nicholas Carew's grandson held the Manor, a distant relative, who became Earl of Totnes in 1625, seems to have dwelt in the house. To him are probably due such additions and alterations as converted the house into one of general Jacobean appearance. The chapel was then cut up into bedrooms, and there still remains part of the stonework of one of the windows that lighted the chapel in the thirteenth century.

In the building known as The Cottage, in this parish, there is a large open fireplace and some old stonework which appear to be portions of an old farmhouse built up in the modern nineteenth-century house. Frith Farmhouse is an ancient building for the most part, probably over two hundred years old, and still possesses the ancient chimney stalks, but the open fireplaces have been built up and the tops of the stacks rebuilt in a modern style. The Chequers Inn is probably two centuries old, and is a picturesque collection of dilapidated buildings. There formerly existed an outside staircase that led to the upper floor. Another interesting old house is Pond Farmhouse, or Ebenezer. Another house, called Priors, has retained its name since the year 1629. A small labourer's cottage, called Chucks, in Chucks Lane, is held with several acres of land, and in the



HEADLEY CHURCH, FROM WEST.

seventeenth century the holder had the duty of keeping in repair eight feet and a half of the churchyard fence.

Leaving the road at Walton-on-the-Hill and crossing a meadow sheltered by the surrounding woods, and then passing through the woods, we reach the bottom of a typical Surrey valley, attaining the village of Headley by a stiff climb. The church is modern, its ancient predecessor being now represented by an ivy-clad grotto built up of some of its materials and overshadowing a family tomb. The present church contains no features of interest, having been built in 1855; but the view northward from the churchyard is very fine indeed, and the church itself is a landmark for many miles around. It is said that the view on a clear day extends for 50 or 60 miles. On the way to Leatherhead we cross the Roman Road, Ermyn Street. This is probably the road which at some points is called Stane Street, or Stone Street. It was the road from Regnum (Chichester) to London, and passed through Boxgrove and Bignor, where is the very fine Roman camp and villa. Entering Surrey near Warnham, it passed through Ockley, where it is again known as Stane Street, to Holmwood, then under Anstiebury Camp through Dorking and Burford Bridge. It then crosses the Mole and passes over Mickleham and Leatherhead Downs to Epsom Downs, Morden, Tooting, and Balham to London.

* Read at a meeting of the Upper Norwood Athenæum by Mr. Charles Wheeler.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) has an interesting article on "Bronze Doors and their Treatment," by Hugo Elliott, which is illustrated by views comparing ancient doors at Pisa and Florence with modern ones at New York, Boston, and Washington. The principal plates show views of recently completed work in New York and Pittsburgh, and a prize-winning design for a bank at Greenfield, Mass.

La Construction Moderne (Paris) devotes its illustrations to decorative interior art at the Salon d'Automne and at the Nationale of this year.

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Moderne Bauformen (Stuttgart) is largely occupied with examples of the work of Professor Hermann Billing, of Carlsruhe, and of Professor Richard Riemerschmid, of Pasing, near Munich. The former's designs are chiefly for high-class residences, and are wholly characterised by stateliness and dignity, whilst Professor Riemerschmid is represented by the interior treatment of the Bavarian Bank at Munich, quite excellent in conception.

The Architectural Record (New York) gives us a thatched palace in the Pocantico Hills, where the mansion and subsidiary buildings are made cottagey with rubble-stone, half timber, and thatch—very picturesque and charming, but a little too much of a masquerade; also the Apotheosis of the Midway Plaisance at Chicago adorned with Lorado Taft's scheme of sculpture. Four houses by Chapman and Frazer appear rather mediocre after this.

Engineering Record (New York) contains details of high-grade building construction in the Soldan High School at St. Louis, the Curtis Buildings at Philadelphia, the foundations for the Municipal Building at New York, and the Maverich Cotton Mills at East Boston.

ARBITRATION PROCEDURE.*

(*Continued from page* 315.)

The Hearing.

IN conducting the hearing an arbitrator is not bound to follow the practice of the Courts, but, of course, is bound by the general principle of law.

Both parties are allowed to have such persons as they may consider necessary for the due presentation of their respective cases. The arbitrator is not bound to allow the parties to be represented, and has power to refuse to hear counsel or solicitors on their behalf. But the usual wish of an arbitrator is that the parties should have every facility given them of presenting their cases clearly, and, in my opinion, an arbitrator would be acting unwisely in refusing to allow the parties to be represented. It is usual for the side instructing counsel to give their opponents notice of their intention of so doing, in order that the other side may know and do the same, otherwise they may be taken by surprise, and an adjournment may ensue in consequence, and certainly under such circumstances the arbitrator would not allow the party failing to give notice costs of the day, and might take a stronger view of the matter.

The arbitrator has power to regulate the proceedings in the arbitration, and it is for him to fix or change the times and places of meetings and to make adjournments, which, of course, should be reasonable and fixed with due consideration to the convenience of the parties. In coming to a decision on the questions in dispute the arbitrator is confined to the evidence placed before him by the parties, and he has no right to call a witness without the consent of the parties. He is bound to observe the rules of evidence no less than judges.

The practice when the parties appear before the arbitrator should be similar to a trial in court, except as far as it may be varied by consent; the claimant or his representative will open or state his case and call his witnesses, who will be cross-examined by the defendant or his representative and re-examined. On the close of the claimant's case the defendant will open his case and call his witnesses, who will be cross-examined on behalf of the claimant. The defendant will then sum up, and last of all the claimant will address the arbitrator. Of course, if the defendant does not call any witnesses, the claimant will sum up, and the defendant will have the last address to the arbitrator. The arbitrator will be entitled at any time to ask any questions of any of the witnesses, but it is better to do so after the witness has been re-examined; and it is the duty of the arbitrator to make full and careful notes of the arguments and evidence, and these will be found extremely useful even where a shorthand note is taken and even if the proceedings are printed. On the close of the case the arbitrator has to make his award. This may take some little time. It will all depend upon the difficulties and length of the proceedings.

When there are two arbitrators and an umpire it is usual for all to sit together and hear the case, as in the event of the arbitrators not agreeing the umpire will then be able to come to a decision and publish his award without re-hearing the case again; but he should not interfere with the conduct of the case until the arbitrators have disagreed—in fact, until that has happened he has no right to be more than an interested spectator; but I fear in many arbitrations the umpire takes the chair, so to speak, and takes upon himself the position of a kind of senior arbitrator when he is not justified in doing anything of the kind. When the arbitrators have disagreed and given notice that it will be impossible for them to agree upon an award, then it is for the umpire to take upon himself the conduct of the arbitration, and the function of the arbitrators appears to have come to an end.

The Award.

An award which is the decision of the arbitrator or umpire, as the case may be, has been described by Lord Blackburn as "the decision of one having limited authority to determine those matters submitted to him by the parties, and no other."

An arbitrator need not make an award unless he has undertaken to do so, but if he does make an award it must be his own, and not someone else's, although in the framing of the award he may employ any assistance he requires.

In drawing the award there is no absolute necessity to insert any recital, although it is usual to refer by recital to the submission to the fact that the arbitrator has taken upon himself the burden of the reference, that he has heard the parties, their witnesses and counsel or solicitors, stating the place where and the dates on which the sittings have been held, and the consideration by the arbitrator of all the questions and matters submitted to him; also of the request to state a special case on any point of law which has arisen, if any such application was made. These are put in as a matter of record, and, when a case is stated, to give the Court information when the award is brought before it at any subsequent time for argument and consideration. The opportunity of inserting recitals should, however, be used very sparingly indeed, with a view to preventing any contention of want of consistency or uncertainty being based upon such recitals when taken in conjunction with the operative part in the award. The arbitrator should make the document as short as possible consistent with clearness, and he should bear in mind that all he is required to do is to decide the questions submitted to him by the parties, and not to give his reason; for if he does this, and the reasons are bad in law, the Court will probably refer the award back to him for reconsideration, with a direction as to the law, thus causing the parties expense and delay.

In nearly every case of dispute, when the arbitrator has taken the precaution to insist upon the parties properly formulating their claims a decision can be worded by adopting the wording of the claim or defence or question submitted, as the case may be; and where an award is in the express and distinct words of the reference, and the words are not ambiguous, it is not competent for the Court to enter upon an inquiry as to whether the arbitrator understood the whole scope of the award.

Some cases lend themselves to simplicity: for instance, in an arbitration on a claim by a landlord under a lease, as to the amount payable for dilapidations, the rights of the parties, so far as the award is concerned, can be settled by directing that the one shall pay to the other a sum of money; or if it is a question as to whether certain work shall be done by a lessee, by directing that such work shall be done in a specified manner and within a stated time, and that, failing it being done as directed, the party ordered to perform it shall pay to the other party a fixed sum of money in lieu of performance, provided the submission is wide enough to cover this alternative.

The arbitrators must make their award in writing within three months after entering on the reference or after having been called on to act, and an umpire within one month after the original or extended time appointed for making the award of the arbitrators has expired. The arbitrators, however, can themselves, by writing signed by them, extend the time, apparently, indefinitely, so long as the extension is effected before the original or extended time has elapsed.

Although the award is not bound to be in any precise or technical form, it must not lack certain essentials. The necessary essentials to make an award valid are:—

1. It must be in writing and under seal if the submission requires it, and in either case it must be signed by the arbitrators or umpire, and is usually attested by a witness.

2. It must be entire—*i.e.* the whole of the matters included in the submission must be dealt with, and it must not exceed the submission.

* A lecture delivered by Mr. George Philips, J.P., of the Inner Temple, barrister-at-law, before a meeting of the Auctioneers' Institute at Russell Square, London, on November 9, Sir Robert Buckell, J.P., president, in the chair.

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3. It must be final. If one matter included in the submission (in the absence of agreement to the contrary by the parties) is left undealt with the whole award will be bad.

4. It must be certain, and not ambiguous. This does not, however, exclude the arbitrators from awarding that alternative sums shall be paid, or alternative acts done, according as the Court may decide a point of law raised for its decision.

5. It must be possible, reasonable, legal, and consistent.

The drawing of an award is very important. In a very simple case a lay arbitrator can, of course, draw it himself, but in any complicated matter, if he is prudent, he will put his findings as to facts and figures down in writing, and hand them, with copies of the submission and other material documents, to his legal adviser, with instructions to draw the award for him, and will include the expenses so incurred in his own charges, which should be fixed by the award. It is extraordinary how very few arbitrators know how to properly draw an award, and unless the necessary requirements are very carefully considered and the grounds upon which an award will be set aside well known and borne in mind by the arbitrator, it is very easy indeed to produce an award which is utterly valueless.

Arbitrators' and Umpire's Fees.

The arbitrator and umpire, as a general rule, charge for their services. A sum may be agreed upon beforehand, but if this is not done there is certainly an implied promise to pay them reasonable fees, and under clause (1) of the Schedule to the Arbitration Act the arbitrator is entitled to tax and settle his own fees as part of the costs of the award, and to include them in the award, unless this power is excluded by the terms of the submission. If he does not settle his own fees as part of the award, they will be subject to taxation as between the parties to the arbitration.

An arbitrator has a lien on his award, and it is usual not to deliver it until his fees are paid.

An umpire should include his own and the arbitrators' fees in the award, although he should not award a lump sum for the lot so as to prevent the parties from challenging his own charges; and in one case where an umpire did this the award was remitted to him to separate the amounts. Although as between the parties, on taxation of the costs of the arbitration, taxing masters are not bound to allow any sum the arbitrator chooses to charge for his fees, yet if the amount is fixed in and forms part of the award itself (upon payment of which only the award can be taken up), the amount, so far as the arbitrator himself is concerned, cannot be challenged; and it has been decided that, *primâ facie*, a court of law is not the proper tribunal for determining the proper amount to be paid in such a case. In the absence of any evidence that the fees are unfair or unreasonable such fees cannot be recovered from the umpire or arbitrator.

This decision does not seem very satisfactory, and certainly somewhat unreasonable; however, in my opinion, in a clear case of overcharge a way could be found of making an arbitrator refund. The course to pursue if the fees demanded by the arbitrator are, in the opinion of the person taking up the award, so excessive as to amount to extortion is to ask the arbitrator whether it is only on payment of such fees that he (the arbitrator) will deliver up the award; if the arbitrator states that such is the case, then the person taking up the award, when paying the arbitrator the amount demanded, should hand to the arbitrator a memorandum in writing stating that in his opinion the amount is excessive, and is paid by him to enable the award to be taken up and under protest, and that proceedings will be commenced to recover the excess beyond that which is held to be reasonable on taxation. By adopting such a method an action for recovery of the excess paid will be more likely to be successful, the party claiming being in a position to plead that the payment was made under compulsion and not voluntarily. Further, I am not at all certain that the Court would not set aside the award on the grounds of misconduct in such a case; but I have not come across any decision on this point.

(To be concluded.)

H.M. Trade Commissioner for Canada reports to the *Board of Trade Journal* that it is proposed to erect at Montreal a fireproof building, 130 feet high, at a cost of 1,000,000 dollars (about 205,000*l.*). Construction is to be begun on May 1 next, and the building is expected to be completed in two years. The name and address of the architects may be obtained by British firms on application to the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Interim Report on Reinforced Concrete.

Sir,—I note in above report that Mr. A. E. Wilson, C.E., makes some reference in his evidence to the use of trass as an admixture for cement concrete, and gives his opinion that the subject is worthy of careful consideration. The advantages Mr. Wilson seeks to obtain are greater impermeability and a prevention of the centre of the mass remaining green.

Mr. Wilson states that the latter object has been secured by the use of a slow setting cement, but I venture to submit that this method involves uncertainties which do not occur when trass is used. The time required in the setting of any cement will largely depend upon temperature and other external conditions, as also to some considerable extent upon the peculiar nature of the aggregates used, all of which cannot be the same in actual work as in the laboratory in which the initial tests are made, to ascertain whether a cement is quick or slow setting. In illustration of this an experience was related at one of the early meetings of the Concrete Institute which went to show that the same cement which was quick setting when used at Devonport was slow setting under similar conditions in the North of Scotland owing apparently to a variation in temperature. Whilst the probabilities of a too rapid surface hardening may be decreased by the use of a slow setting cement, the danger of the interior still remaining green cannot be entirely obviated.

Mr. Wilson gives the experience of Mr. Werner at Aberdeen that trass made the concrete more water and air tight. This it would certainly do; but I respectfully suggest that it would also do something of more importance than make the cement a little slower in the initial process of setting, as by entering into combination with the lime particles in the cement it would produce a permanent hardening in the interior of the mass (and removed from contact with the air) with equal rapidity to that process on the exterior.

If the concrete mixture is sufficiently open to allow the combination of air with the binding materials in the centre of the mass, notwithstanding a slower setting cement being used, the resultant impermeability which Mr. Wilson claims as desirable in all reinforced concrete construction will not exist. I was privileged some little time ago to examine the effect of trass in the interior of one of the piers of a railway bridge over the Rhine at Coln, which was being taken down to be replaced by a larger structure.

This bridge had been built about sixty years, and in the centre some 8 feet from the outer surfaces of one of the piers the mortar was as hard as at the surface, and as firmly attached to the surrounding stone as if a part of its structure. In the construction of the new bridge the standard specification issued by the administration of State Railways has been used, and all mortars and concretes contain equal proportions of trass and cement in addition to the ordinary aggregates of sand and stone. Another peculiarity of trass which is an advantage to reinforced and other concrete, is that its admixture imparts a flexibility to the concrete it would not otherwise possess.

In a recent paper I was privileged to contribute to a meeting of the Association of Municipal and County Engineers on the subject of concrete, I ventured to suggest that a careful selection of aggregates, proportioning of volumes, and intimate mixture of particles, was necessary to secure efficiency in all reinforced and other concrete constructional work, and respectfully claim that a consideration of the methods I then advocated would tend to secure most of the essentials deemed to be desirable by the several witnesses who gave contributions in the report to which I have taken the liberty to refer.

I further claim that without the use of trass or some admixture containing similar properties, equality of permanent hardening in the mass and impermeability in concrete cannot be assured.—Yours faithfully,

William Challoner.

Blackpool: November 17, 1910.

A school is to be built by the Cheshire County Council near to Heathfield Road, Ellesmere Port, to accommodate 450 children.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, December 3.

Society of Architects : Visit to Royal Automobile Club Premises, Pall Mall, S.W.

Monday, December 5.

Royal Institute of British Architects : Mr. Reginald Blomfield, A.R.A., on "Pierre Lescot and Jean Goujon."

Liverpool Architectural Society : Mr. Albert H. Hodge on "Architectural Sculpture."

Wednesday, December 7.

Manchester Society of Architects : Mr. Raymond Unwin on "The City Development Plan."

St. Paul's Ecclesiological Society : Mr. Patrick H. Hepburn on "The Romanesque Churches of France."

Thursday, December 8.

University College, London : Mr. J. A. Gotch on English Domestic Work; Lecture (7) on "Inigo Jones and his Successors."

London Institution : Professor V. B. Lewis on "Smoke and its Prevention."

Leeds and Yorkshire Architectural Society : Mr. Mowbray A. Green on "The Architecture of Bath."

THE COMACINE MASTERS.

THE industrial organisation of the Roman Empire, under which all crafts and trades were organised in a series of *collegia*, exerted its influence over the whole of Western Europe after the supremacy of Rome had declined with the weakening of her imperial power.

Crafts and trades that had felt the benefits of the Roman organised system were not disposed to abandon the advantages they enjoyed because they were working under a changed Government. Nor, on the other hand, was transference of authority inimical to the preservation of the organisation when wise rulers recognised the advantages that the maintenance of the corporations or *collegia* afforded as facilitating the work of government. A strong corporate body, with the advantages of practical monopoly in its particular sphere, possessed great powers of discipline over its members. Hence its chiefs were valuable allies to a ruler, just as Mr. REDMOND, with his following of submissively voting henchmen, is a valuable ally to our present Government. And equally so the craftsmen-allies of the successors of the Roman Empire could exact their price for their support and assistance.

It was in this way that the Comacine Masters first obtained their recognition. In the magnificent book on "Lombardic Architecture,"* by Signor RIVOIRA, an English translation of which, by Mr. RUSHFORTH, has recently appeared, there is a short chapter on the Comacine Masters, which lucidly explains the comparatively small amount of knowledge we possess concerning the early history of this corporation or guild.

Signor RIVOIRA tells us, on the authority of TROYA, that the expression "magistri Comacini" appears for the first time in the code of the Lombard King ROTHARIS (636-652), where they figure as master masons, with full and unlimited powers to make contracts and sub-contracts for building works; to have their *collegantes* and their *servi*. Thus the guild of the Comacine Masters was evidently composed of the usual triple elements of industrial corporations or guilds in the Middle Ages: masters, fellow-craft or journeymen and apprentices, or, in other words, organisers and captains of industry, skilled artisans, and unskilled or partially skilled workmen.

The guild was confirmed in its privileges by the provisions of the "Memoratorio de mercedes Comacinorum" of King LUITPRAND (712-744), and then formed a corporation of architects, builders, carvers, and workmen, to whom was granted a legal monopoly of public and private building work within the territories occupied by the Lombards, and whose schedule of pay was regulated by the ordinances that conferred their privileges. Architecture, including building, carving, and the allied crafts, was then, in short, a close profession, with a recognised scale of charges.

Although the earliest reference to the Comacine Masters which is known is that in the Code of Rotharis, the corporation must have previously been in existence and have attained some degree of importance before ALBOIN'S descent on Italy in A.D. 568. These early workers in the art of architecture are, therefore, historically important as forming a connecting-link between the *collegia* of classic Rome and the guilds of the Middle Ages.

There seems to be an absence of documentary evidence as to whether CHARLEMAGNE either maintained, diminished, or abrogated the privileges bestowed on the Comacini by the Code of Rotharis and the "Memoratorio" of LUITPRAND, and Signor RIVOIRA finds no confirmation in Papal bulls, the acts of the Carolingian kings, or in the best known annalists, of AMICO RICCI'S statement that in the Empire of CHARLEMAGNE these associations were exempted from obedience to every local law, statute, and obligation, and were also empowered to fix the scale of payments, and in their chapters-general to settle without interference everything connected with their internal government. Nor does Signor RIVOIRA find any evidence that the Popes confirmed the Comacine Masters in the privileges they enjoyed in Italy and extended the scope of those privileges to all the Catholic countries whither they were led by the objects of their association.

Signor RIVOIRA also joins issue with those who argue that in the days of CHARLEMAGNE the Comacine Masters took up the position of secret societies and began to be called "free" or "frank" masons, and that from these were derived the societies specially known as freemasons. We think that here the issue is confused by an unnecessary and unwarranted connection of the Freemasons of mediæval architecture with the system of modern Freemasonry. The operative freemasons of the Middle Ages were "free" of their craft by virtue of their properly served apprenticeship, during which they had learnt the purely operative "secrets" or "mysteries" of their calling, and at the end of which they were enrolled as freemen of a particular company or lodge, "loggia," "loya," or "loia." In this respect they were on an equal footing with freemen of other corporations of craftsmen and traders, such as the Worshipful Companies of the City of London and other cities, not only in England, but throughout Europe, where it was the privilege only of those who were "free" of the city to practise any particular craft or trade within the jurisdiction of the company in which they were enrolled, this body in return for the monopoly they enjoyed taking care that freemen should be properly educated and should pursue their cali-

* *Lombardic Architecture : its Origin, Development and Derivatives.* By G. T. Rivoira. Translated by G. McN. Rushforth. In two vols., with over 800 illustrations. (London : William Heinemann. 63*s.* net.)

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ing honestly and honourably. We have not heard it suggested that the Worshipful Companies of Carpenters, Loriners, Goldsmiths, or Mercers were the prototype of modern Masonic lodges, and there is no valid reason to suppose that the Freemasons of the Middle Ages differed in essence from the companies of other crafts and trades. But there can be no doubt that such guilds as that of the Comacine Masters were the forerunners of the organisations that existed in mediæval times and formed travelling bands of skilled artificers, who were ready to build a cathedral, a castle, or a palace for any employer who needed their services.

NOTES AND COMMENTS.

IN a letter which appeared in the *Times* on Friday last Professor PITE, arguing in favour of his scheme for uniting Sir ASTON WEBB'S archway from the Mall with Charing Cross and Trafalgar Square, states that he first made the suggestion four years ago. We do not remember to have seen this, but must withdraw the imputation of plagiarism that we made last week. As Professor PITE suggested four years ago the scheme he is now advocating we were wrong in supposing that he had borrowed the idea from the plan which Mr. STOKES exhibited at Burlington House.

A JOURNAL of the nature of *The Architect* cannot interest itself in political controversies. No party spirit has ever been exhibited by us, nor do we intend that at any time shall this Journal take any side in political questions as between party and party; but at times we have had to speak in no unmeasured terms, as in the case of the proposed tax on clay as a mineral. We must now take most emphatic exception to the statement recently made by the Chancellor of the Exchequer that the building trade was good, and that there was no depression in that industry. Either the gentleman who occupies this prominent position in His Majesty's Government is particularly ignorant on this subject, or he lays himself open to a charge of stating that which is absolutely false. The building trade is the largest home industry, and for the past three years it has been most seriously affected by the political unrest. It is a shy industry, absolutely dependent on capital with labour. Unsettle the money market and down goes the building trade. If the legal minds of our party leaders could grasp this fact much of the present want of employment for the working-man, with the attendant hardships for his wife and family, might be obviated. We know that politicians may be led sometimes, in the excess of political enthusiasm, to make statements which are not quite correct; but this tendency is unfortunately on the increase, and it is time that an emphatic protest should be entered against a repetition of such statements in the future. The building industries will, and must, improve; but this can only be brought about by His Majesty's Government, be it Liberal or Conservative, settling down to a steady and business like progress. May such a result be the outcome of this present General Election.

THE Corporation of London has given public notice of the intention to apply to Parliament in the ensuing session for an Act empowering the Corporation to construct the new St. Paul's Bridge and to rebuild Southwark Bridge in accordance with plans and sections deposited for public inspection with the Clerk of the Peace for the City of London, the Clerk of the Peace for the County of London, the Town Clerk of the City of London, and the Town Clerk of the Metropolitan Borough of Southwark. That is to say, the Corporation do not intend, unless they are forced to do so, to depart from the scheme approved by the Common Council.

ANOTHER interesting discovery has been made on the site of the new County Hall, this being a stone bearing the inscription, "Lambeth boundary of Pedlar's Acre, 1777." The stone is one of several erected in 1777 by the Lambeth Vestry in order to define the bounds of a piece of land known as Pedlar's Acre, forming part of the parish estates. The Local Government Committee proposes to replace the stone in its original position. The Pedlar's Acre was bequeathed to the parish by a pedlar, who, the story goes, left an acre of land in recognition of kindnesses he received. It is also said that the land was bequeathed upon the condition that his dog should be buried in the churchyard, but this story may be apocryphal. However, in the old Lambeth Parish Church there is a stained-glass window depicting the pedlar and his dog. The famous acre in 1504 brought in only 2*s.* 8*d.* a year in rent, but just prior to its sale by the Lambeth Council to the London County Council, in connection with the new County Hall scheme, it was bringing in 1,800*l.* a year.

A LETTER has appeared in the *Manchester Guardian* from a Manchester architect urging that the competition for the proposed buildings on the Infirmary site should be limited to Manchester architects. The advocacy is really a slur on the ability of these gentlemen, as it implies that they are not capable of winning in an open competition. That is to say, Manchester is to put up with an inferior design because there are no architects in Manchester capable of holding their own in an open competition. The writer of the letter relies upon precedents, of which there are no doubt many, to support his case, but overlooks the obvious inference. For our part, we think that there are plenty of architects in Manchester who are quite capable of winning this important work in open competition.

THE Committee in charge of the Liverpool King EDWARD Memorial persists in disregarding the adverse criticism of the placing of the memorial at the base of St. George's Hall, and this criticism has been still further strengthened by a letter which the *Liverpool Courier* has obtained from Mr. THOMAS BROCK, R.A., who says:—"It is difficult for me adequately to express my feelings in regard to the proposal which is being made to cut into the base of the St. George's Hall at the south front, and to erect there a memorial to the late King. That such a proposal should be seriously considered seems to me incredible, and I sincerely trust that the people of Liverpool will strenuously resist it. The St. George's Hall is universally considered to be one of the finest modern buildings in Europe. Its grandeur arises to a very great extent from the nobility of its proportions and the simplicity and purity of its style. To interfere with one single line of it would be to spoil the whole. To me the placing of a monument upon the south end of its base must constitute not only a glaring incongruity, but an act of unpardonable disrespect to the memory of the great architect who designed the building; while the memorial itself, thus attached to and a part of a vast edifice, would possess an insignificance which, as I think all will agree, such a memorial should not possess. In conclusion, I can only repeat the hope that the people of Liverpool will do everything in their power to prevent this most unworthy suggestion from being carried out."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN extra general meeting of the Royal Institute was held on Monday evening, the 28th ult., at Conduit Street, Mr. Leonard Stokes, President, in the chair. A critical and historical paper (of which we give an abstract below), illustrated by lantern slides, was read on the Mosaic and Marble Work of the Cosmati at Westminster Abbey. This appears in the shrine of Edward the Confessor, the tomb of Henry III., and other tombs, and in the mosaic work before the altar, and in the sanctuary. There were also on view in the adjoining galleries full-sized coloured reproductions of the works which have been executed under the direction of Professor Formilli by order of the Italian Government for the International Exhibition of Art to be held in Rome in 1911. There was no introductory business, so after a brief introduction by Mr.

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Leonard Stokes, Chevalier Professor C. Formilli read in English his paper on

The Monumental Work of the Cosmati at Westminster Abbey.

The Cosmati were art workers of Rome, and like the Della Robbia carried on their work for generations. The founder of the family was a certain Laurientius, whose son Jacobus Cosmati did marble work in St. Saba in Rome in 1205, and soon this family of art workers increased. They carried on with religious fidelity their art, improving year by year their work and increasing their reputation, so much so that their fame quickly spread even to Westminster. For a church to possess a floor, a pulpit, a cloister, or even a column only, decorated by the Cosmati was almost as precious as to possess a relic of a saint. The Cosmati were not only architects of great repute, colourists as great as Titian, but they were marble carvers such as the world had never seen before. They worked piously on their knees, and instead of whistling popular airs, they sang hymns of praise to the God for whom they worked. In fact, only men who worked for God could have done the work they did.

At the time of great religious zeal in England a king died whom all men called saint. That King was Edward the Confessor. The Cosmati were invited to London at the time of Henry III. to make the tomb to receive his bones.

They brought with them their stones and their tools to Westminster, at which place they continued working for some years. Richard de Warr, then Abbot of Westminster, visited Rome himself, bringing back the rarest jaspers and marbles.

The shrine of Edward the Confessor is a monument without any architectural pretensions whatever. It is composed of an oblong block of marble resting on a step, with three niches cut out of each of the two longest faces, and with a large cornice on the top supporting the sarcophagus containing the body of the King. The whole surface was once encrusted with the most sumptuous mosaic work of original patterns, generally on gold background. Rich coloured square or round stones, of verde antique and porphyry, made the centres round which the various patterns circulated. It is absolutely surprising the skill with which the small tessera were embedded in the cement, catching the light according to the will of the artist. Unfortunately, very little mosaic is left. One of the most remarkable features of the work is the variety of the patterns in all the panels. Each of these patterns has been invented on the spot and designed with the chisel straight on to the stone itself.

This monument has gone through the greatest vicissitudes. First it was robbed of everything that could be turned into money by Henry VIII., then pulled down altogether. It was re-erected in 1557 and the pieces put up wrongly, and then robbed of all the remaining mosaic work by pilgrims, who looked upon a tessera of mosaic as a relic of the Saint. But the last, and by no means the least, of the damage was done when they attempted to restore it to its primitive magnificence by filling up with plaster the spaces where mosaic had once been, and painting it over with oil colours —a sort of imitation of the original work. Fortunately, time, and above all the devotional habits of the pilgrims, of rubbing rosaries on the monument, rubbed off the imitation of mosaic, thus leaving only the plaster. In more recent times, before the wise *régime* of Dean Robinson and the inestimable service of Professor Lethaby, to whom English art must always remain deeply indebted, a modern marble altar has been built against one of the sides of the shrine on a step of about twelve square feet, thus concealing a part of the mosaic pavement and a good part of the monument itself. It would render a great service to art if this altar, together with the gold cornice and red canopy, could be removed, thus restoring the whole to its primitive beauty.

The monument of Henry III. is composed of two sarcophagi, one over the other, the top one containing the body of the King and the lower one that of Queen Eleanor, his wife, with a magnificent recumbent bronze figure of the King, by a certain Torel, surmounting the whole. Only three of its sides could be reached by the desecrators, and consequently three of the most important panels have been partially preserved in their primitive state. The two biggest panels of the top part are decorated with sumptuous slabs of porphyry. The slab on the best preserved side is surrounded by a magnificent mosaic pattern of gold and coloured stones; the lower panel is still more important in design, the mosaics being quite marvellous. Nothing more wonderful of the kind has ever been done.

Another interesting monument, although of much less importance, is the little one to the children of Henry III. It is simply a sarcophagus half embedded in the wall, showing only one front and the top, which is beautifully decorated with a pattern of mosaic in gold, white and brown.

One of the two slabs of marble in the floor of the sanctuary containing the remains of John and Margaret is attributed to the Cosmata Petrus. Only a very little of the primitive work has been preserved, and this is a geometrical pattern of white and red mosaic framed by brass borders and letters.

The Cosmati did not limit themselves to monumental work, but also did pavement mosaic of equal importance. Their work is often wrongly called "Opus Alexandrina," instead of "Opus Romanum" as they themselves called it, the former being the name given only to the previous mosaic pavements of earlier Christian art.

The pavement work in the sanctuary is by Oderico Et Albas, and no doubt is the most uncommon of the kind ever seen. In this pavement there is not the stone framework usual in mosaics of the period; it seems as if the pattern were imbedded into one plain floor of stone. The unique pattern, although purely Byzantine, gives the impression of being in arabesque. It has been greatly damaged, and is now covered with oilcloth to preserve it.

The other pavement in front of the altar is the work of Petrus Civicus Romanus, and almost covers the sanctuary floor. It may be said that Petrus never did anything else so sumptuous. The human mind will never be able to conceive a more wonderful work. The design is made up principally of circles intersecting each other, and then resolving into square and rectangular forms; each square and circle is filled up with innumerable smaller designs made up of tiny pieces of mosaic. The grouping of the colours and the rest, given at intervals, is so judicious, producing such an exquisite harmony, that nothing better could be produced by the brush and palette.

Professor W. R. LETHABY, at the conclusion of the paper, said he had no doubt that he had been called upon to propose the vote of thanks to the lecturer simply because he had had the pleasure of watching Cav. Professor Cesare Formilli do his work. That work, he might add, had been done with such extraordinary accuracy that the next room, where the full-sized reproductions were, looked as if the abbey itself had been robbed of its tombs. He was delighted to take advantage of the opportunity to congratulate Professor Formilli upon the completion of his undertaking. It was to be hoped that one result would be to throw such light on certain Westminster monuments as to enable them to discover who exactly did them. There are six works in all at the abbey of that kind, only two of which are definitely signed and dated. The closest parallel to them was to be found in a couple of tombs at Viterbo. According to an old writer one of the latter bore an inscription which ran "Petrus Oderisii sepulchri fecit hoc opus." It had been suggested that this man was the same as the dual name at Westminster of Petrus and Oderico. It was at any rate a remarkable coincidence that the names should occur on one single monument. On the top of the tomb of the Princess Katherine there is a stone which is so irregular and so far from being intrinsically precious that Professor Lethaby thought it must be something in the nature of a relic, probably being brought from the Holy Land.

His Excellency the Italian Ambassador said he could not disguise the fact that he felt somewhat embarrassed at being called upon to speak. In the first place he was not an artist, though he appreciated art immensely; and in the second he had only an imperfect knowledge of the interesting English tongue. On the other hand, if he were silent it might seem to convey some sort of lack of appreciation of the honour conferred on him, and also of his great pleasure in hearing such an interesting paper, and seeing the photographs of things which he had been familiar with since his young days. In the second place he wanted to take advantage of the opportunity to publicly acknowledge his personal gratitude, and also that of the executive committee of the International Exhibition at Rome, 1911, to the Dean of Westminster and to Professor Lethaby for their extreme kindness in allowing Professor Formilli to proceed with the reproduction of the monuments in Westminster Abbey. This proof of interest and kindness would contribute to the exhibition. On the success of the latter all Italians had set their hearts, because it was to commemorate the fiftieth anniversary of the foundation of the new free and unified Italy. Therefore the contribution was a further testimony of that sympathy and moral support which Italy received from Great Britain in a time of trouble, and which she had never forgotten, or was ever likely to forget. The occasion had laid the foundations

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of that long standing sympathy which has united the two countries.

Professor BERESFORD PITE said that the debt of gratitude under which they lay to Professor Lethaby for revealing the wonders of Westminster Abbey had been accentuated that evening. Westminster was a wonder of wonders. The debt that the abbey owed to Torrigiano for the marvellous effigy of Henry VII., for the screen, and for the figure of the Countess of Richmond had always been felt. Professor Cesare Formilli, however, had brought to their attention an earlier link with Italian art which was not as popularly recognised as the other. The paper certainly dealt with a subject which was highly suggestive. It enlarged one's conception of the current of mediæval thought in England to learn that Henry III. turned to Italian artists for the central portion of the shrine of the Confessor. At that early time there was probably a considerable amount of novelty in such a proceeding, though two centuries later it was generally recognised that Italy was the source of art inspiration. The interesting Cosmati work at Westminster indicated a divergence in the stream of Gothic art. There was no doubt that the common source of inspiration was the East. But from the time of the eleventh century those craftsmen and tradesmen who never left the English shores developed with amazing rapidity an art which culminated in Westminster Abbey. As one looked at Westminster it was impossible to feel anything but proud of our insular art. It was most interesting to be reminded of the intimate connection of this culminating period of English art with the work of the artists of Italy. When we look at the tombs we find they stand comfortably and harmoniously in our thirteenth-century abbey, speaking a different language, echoing a different music, but they are strangely harmonious expressions of the same mediæval ideal. Not only is the divergence of the streams which met at this spot marked, but the different atmospheres are marked for us. In this country all the intelligence of the artist was concentrated on effects of light and shade, whereas on examination of these works of the Cosmati we find that very little artistic value was placed on light and shade, for they concentrated on drawing and colour. For the complete development of the English manner one has only to turn to the tomb of Aymer de Vallence. There are, however, traces of English influence even in the design of the Confessor's tomb. None of the Italian work of the Cosmati has the peculiar English treatment of the trefoils and of the carved capitals. Probably the carving of the caps was executed by English workmen. It would be well if Professor Lethaby would suggest in a sketch what the shrine of the Confessor was like in all its glory and before the erection of the reredos. The apse must certainly have been a most extraordinary sight. The Confessor's shrine is probably one of the few tombs in England still in its original position. The Cosmati pavement at Canterbury surrounded the shrine of St. Thomas. The suggestion as to the two names of the Cosmati which appeared at Westminster appearing also at Viterbo was interesting. Henry III.'s son was slain at Viterbo, and that monarch may well have visited the town when on his way to return to this country. Abbot Feckenham's Renaissance restoration was interesting, for though it was not a respectful restoration it had no pretence of being other than as up-to-date as it could be. Professor Pite said in conclusion that they were under a debt of gratitude to the Italian Government for allowing them to see in London that night the models which were in the next room.

Mr. H. H. STATHAM raised the question as to whether only the family of Cosmati were connected with the work at Westminster. It did not appear as if their names were ever found at Westminster. Works of reference mentioned very few of the Cosmati. He therefore asked information as to whether they were not a school rather than a family.

Professor FORMILLI replied that though there was no name of the artist on the monument, the way the marble carving is done, and the way the tesseræ are introduced (which is absolutely peculiar to the Roman mosaic work of the period) make one conclude that the men who did the work could be no other than the Cosmati. There is no actual historical proof of this, but the kind of work is such that there can be no doubt that it was done by the family or by one of their school—for there was a school of workers called the Cosmati.

Mr. BECKWORTH SPENCER remarked it had always interested him to think of the connection of the mosaics at Westminster Abbey with the ancient Roman Empire. The marble employed may have been part of the remains of columns upon which Cæsar looked, and the cement may have been made from some statue of Praxiteles. It was well to think of the difficulties which attended the transport of material in those days. The dangers undertaken to procure such a work as the Confessor's shrine made present-day efforts to raise monuments look very small indeed.

Mr. LEONARD STOKES concluded the discussion by saying that in view of the interesting exhibition in the adjoining room he did not think they ought to prolong it any further. He then proposed a hearty vote of thanks to Cav. Professor Formilli, and this was carried by acclamation.

THE DEVELOPMENT OF ENGLISH BRICKWORK.*

I MAKE no apology for bringing this subject before you this afternoon, in the first place because of the vital connection of brickwork with the building trade of this country, and in the second, because the subject in its historical and architectural aspect has not generally received the consideration and study which its importance demands.

Brickwork.

The name immediately suggests to the younger of us, perhaps, Board of Education examinations and terrifying questions of bond, to the much competing contractor prices per rod, to the sorely tried architect, "What can I get off my brickwork bill?" for a reduction estimate.

Rather than these all-important questions I would call your attention to some of the beautiful works which have been executed in this material in the past, as illustrating its possibilities for architectural design.

It is hardly necessary to remark the very early use of bricks, both burnt and sun-dried, as building material. "And they said one to another, 'Go to, let us make bricks and burn them thoroughly.' And they had bricks for stone and slime had they for mortar." So we may claim Babel as the first big brickwork contract, and Shinar Plain as the first paying brickfield.

But here it must be admitted that brick for stone has been the continuing truth; men have preferably built in stone, turning to brick generally only in the absence of the finer material. Apart from Santa Sophia I can think of no great historic building of the first order faced in brick. Yet behind the scenes in the dome of the Pantheon and the cone of St. Paul's it is doing its own structural work essential to the stability of these Titans. It is evident that it is naturally suited to an arcuated rather than a trabeated style of architecture. Greek ingenuity could hardly have constructed the architrave of the Parthenon in brick; for brickwork have been reserved triumphs of a more domestic order.

In all countries the natural sequence has been that hill-dwelling peoples with quarries at their doors have built in stone; migrating to the rich clay valleys they have reserved their stone—scarce by reason of expensive transport—for their more monumental buildings, finding in brick a cheap and ready substitute to meet the needs of their growing commercialism. Stone sings the romance of the hills, brick speaks the prose of the plain, even to the latest stone-fronted, brick-backed chapel, a compromise of God and mammon. On the other hand, brick has this advantage, that harmonies and contrasts of colour can be effected in yellow, red, purple and black, to mention merely the natural colours to which clays may be burnt, to rival the possibilities of marble itself. Brickwork has proved itself particularly adapted to the lowlands of this country with their excellent brick earth, abundance of fuel for burning, and sympathetic landscape. I have attempted to show on the map that in England it is possible to draw a geographical brick line diagonally from Somerset to Northants, following the line of the oolite beds as the demarcation north and west of which stone predominates, particularly in historical and monumental architecture, south and east of which brick is the dominant material.

To many of us it is a matter for profound gratitude that London comes in the latter division. Edinburgh in spite of Princes Street, Aberdeen in spite of Union Street, Oxford in spite of High Street, tend to show that the stone city, unless town-planned—as Paris—with spaciousness and scale, is in danger of monotony and dull uniformity. Contrast the higgledy-piggledy charm of Cheyne Walk with the sweeping lines of the Crescent at Bath, the one typical of the homeliness of brick, the other illustrating the dignity of stone. Before examining in detail examples of the various periods of English brick building, may I draw your attention to the map and point out the general disposition of the best examples?

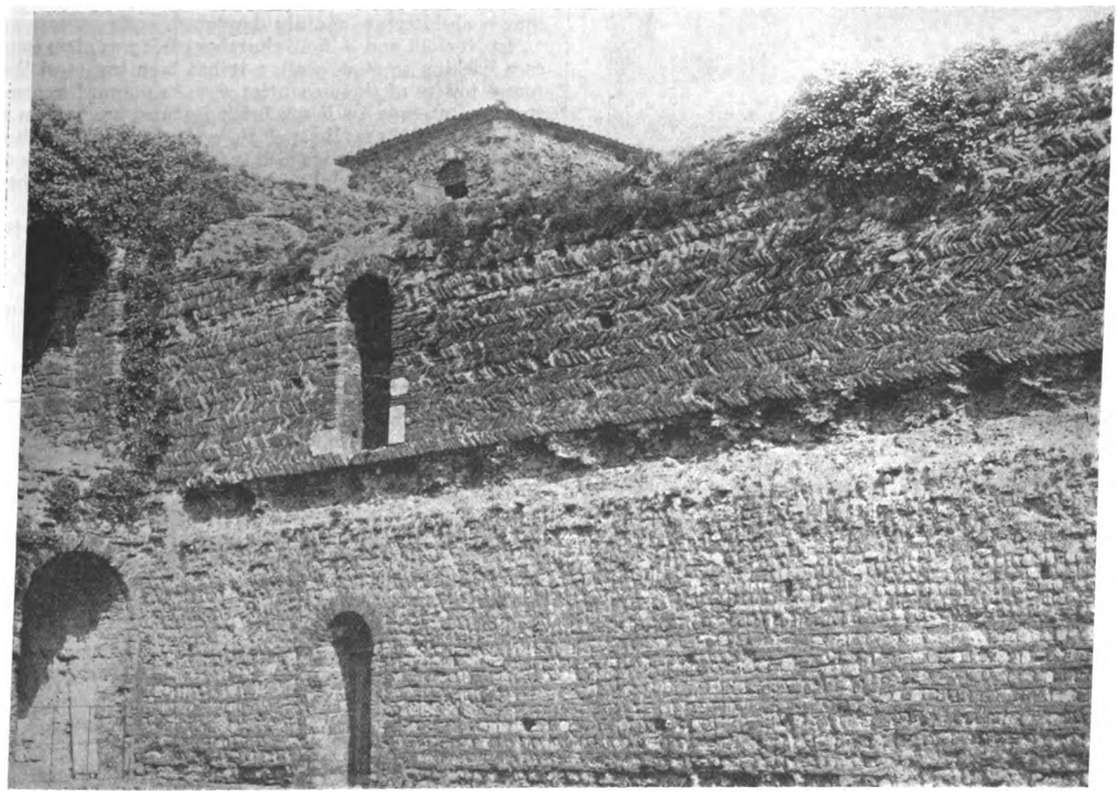
* A paper read before the Institute of Builders by Mr. H. Franklyn Murrell, A.R.I.B.A.

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Evidences of Roman brickwork are spread all over the country, but Essex and Kent especially can show hundreds of churches into which Roman bricks have been subsequently built. Without any question the Eastern counties, particularly Essex, are the richest in Tudor examples. The Home Counties, Kent, Surrey and Hertford, can also show good work. In Renaissance and later times the Eastern and Southern counties still contain the finest brickwork, but in the west and north brick was also widely used.

Roman Brickwork.

A word first as to Roman brickwork in general. If England learnt her brickwork from Rome, Rome in turn had learnt the method from Egypt. Brick arches, elliptical, semicircular, pointed, and even inverted arches in foundations are to be found among Egyptian remains. The Greeks also built brick, though not to the same extent, and much of their sun-dried brick has returned to clay, earth-to-earth fashion. Of Greek terra-cotta ornament much fine work is stored in museums. In Roman work brick was usually only a facing to concrete in arch and vault construction; brick ribs and bonders were used to hold the concrete filling while setting, and economise wooden centering as far as possible. Brick



COURTYARD, COLCHESTER CASTLE.

burning and building do not appear to have been practised in this country prior to the Roman occupation, although existing remains show that the art of pottery was not unknown.

In pre-Roman times the forests of Britain formed the happy hunting-ground of a sporting people whose building needs and ideals were doubtless satisfied by wattle and daub. On the Roman advent at the end of the first century of our era systemised civilisation displaced Celtic disorder. As surely as he fortified his camp and levelled his military road, so surely the Roman introduced the brick-covered construction which, thinking imperially, he had designed for universal service from the Euphrates to the Forth. Roman clay working was not confined to the typical 2-inch flat tile, but included fine terra-cotta work such as may be seen in Colchester Museum.

The elaboration of Roman buildings in Britain may be judged from the fact that they took the trouble to quarry Purbeck and to import Cipollino, Porphyry, and other Italian marbles. It is most unlikely that they would neglect their favourite art of brick and terra-cotta work with material ready to hand.

The remains of Roman brickwork here are in no way different from those in other parts of the Empire. There are examples at most of the Southern Chesters of the two methods of employing brick construction—"Structura Caementicia," a mass of rubble concrete faced with stones, with bonding courses of two or three flat tile bricks, and "Opus testaceum," in which the facing and arch work of structure is brick.

In the north Roman bricks are less in evidence. The Tyne and Solway wall was entirely of stone, though bricks have been found at Inchtuthill, a Roman station in Perthshire. The most important British Roman brickwork is at Dover, in the Pharos Tower and at St. Mary-in-the-Castle. In the walls of the former are the usual bonding courses of flat tiles, some of which have ledges forming a key.

Portions of the walls and bastions at Colchester still remain. An enormous amount of brick must have been manufactured at this city. The traditional sites of Roman kilns are still visible. The withdrawal of the Roman troops abruptly terminated scientific construction in this country.

Reasonably it might have been expected that a people familiar for 300 years with Roman method, and surrounded in all likelihood with magnificent examples of its success, would have striven to continue, at least for a time, its sane traditions. To the unrest and upheaval consequent upon Roman departure and Saxon arrival may be attributed the failure of post-Roman builders to appreciate the Basilica, the Thermæ, and the villas, other than as yards of ready-made material. With an ignorant vandalism, the Saxons misused their stolen material, often building into their arches tapered Roman voussoir bricks upside down, instances such as occur at Britford, near Salisbury.

Saxon obtuseness is also noticeable at St. Pancras Church, Canterbury, where Roman triangular facing bricks are set with their points outwards. Quite remarkable is the tower of Holy Trinity, Colchester, showing throughout a consistently intelligent use of Roman bricks employed in an essentially Saxon manner. Of especial interest is the west door with its triangular head and slight imposts.

The Norman.

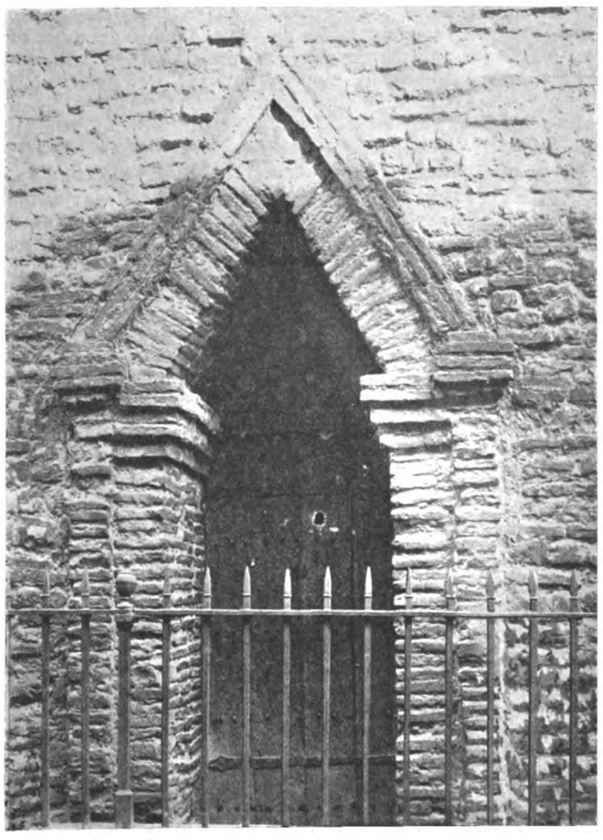
Norman builders, having acquired a developed masonry with the aid of the fine French building stones, introduced into England a stone tradition for church and castle, to be maintained throughout the ages of Romantic faith. Yet in spite of this general truth there exists quite a group of buildings in which the Norman, given a box of Roman bricks, has put them together with vastly more skill and interest than had his Saxon predecessor.

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To briefly examine these buildings, St. Albans Abbey, commenced about 1077, was largely constructed with Roman bricks from Verulam.

Colchester Castle, built about 1078, is largely composed of Roman bricks. The fine herring-bone bond in the courtyard shows how effectively this walling could be constructed in tile.

St. Botolph's Priory, Colchester, shows an ingenious use of Roman bricks in columns, arches, and arcading.



DOORWAY OF HOLY TRINITY, COLCHESTER.

We are hardly justified in saying that no bricks were burnt in this country from the time of the Roman evacuation in 420 till 1260, the date of Little Wenham Hall, Essex, but brickmaking as an industry and brick-building as an art certainly did not exist during that period. Shortage of quantity or inferiority of quality was met by Norman preference by the importation of stone from Caen. But during this period great things were being done in brick in Southern Europe.

Byzantine architecture depended almost entirely for its external effects on brickwork, treated broadly with strongly marked bands of colour, whilst the Gothic architecture of Northern Italy is remarkable for the beauty of pattern and richness of colour of its brickwork and terra-cotta. But if the palmer from the East or the pilgrim from Rome brought back accounts of these brick glories in Asia Minor and Northern Italy, his tale fired the soul of no great brick builder in this country. It is evident that the first cause for the re-use of brick was the growing scarcity, not only of stone, but of timber. The constant destruction of timber buildings by fire must have been a contributory cause to the introduction of a more resisting material. This movement naturally manifested itself first in the Eastern counties and in work of a domestic character.

Little Wenham Hall, Suffolk, built about the year 1260, has long been considered the earliest remaining record of this movement. Here bricks averaging $9\frac{3}{4}$ by $4\frac{3}{4}$ by $2\frac{1}{4}$ inches, now dull in colour, are mixed with stone and flint in the general walling.

The little chapel of St. Nicholas, Coggeshall, is a most important link in brick history. In plan a simple rectangle, this church must have been constructed not later than the end of the thirteenth century.

A very remarkable development took place in the neighbourhood of Hull late in the fourteenth century. It is evident that this brick fashion was imported to this seaport town from the Low Countries, where many early churches are found in brick. According to Leland, in the time of Richard II. Hull seems to have been a completely brick-built town:—

"And yn his Tyme the Towne was wonderfully augmented for building, and was enclosed with Diches and the Waul begon and yn continuance ended and made all of Brike, as most part of the Houses of the Towne at that Tyme was."

The curious fact appears to be that Bishop Lyttleton saw bricks lying in a trench, having fallen from early stone walls to which they had been applied.

In many churches in the neighbourhood of Hull brick facing was used for the general walling. Brickmakers of to-day need not complain of the low price of bricks, for those used for King's Hall, Cambridge, in the reign of Edward III., cost 6*s.* per 1,000, while in the times of Richard II. and Henry IV. and V. they varied from 5*s.* $7\frac{3}{4}$*d.* to 6*s.* 8*d.* per 1,000. But then bricks varied greatly in size. Those used in the Priory at Ely in the reign of Edward II. were 12 by 6 by 3 inches; in many fifteenth-century buildings in Norfolk and Suffolk those employed are 9 by $4\frac{1}{2}$ by $1\frac{1}{2}$ inches.

Church Work, 1400-1500.

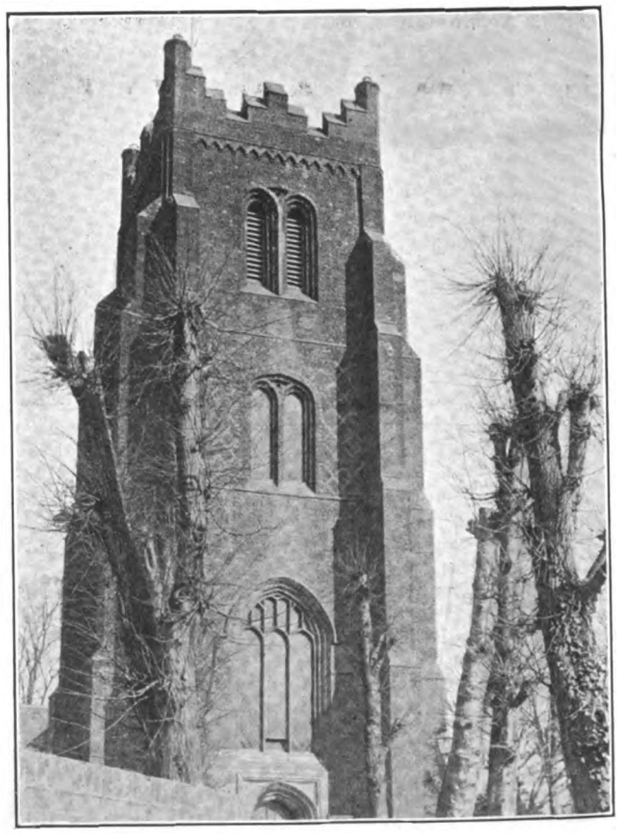
Although throughout the Eastern and Southern counties churches may be found with brick walls and facings of fifteenth-century date, it was in Essex and Suffolk that brick church architecture mainly developed.

In Norfolk and Suffolk churches brick was often employed as a backing to stone walls; it has been suggested that the round towers of these counties were so planned to economise stone. But even in Essex brick features are rare in sacred buildings and are limited to a few towers, porches and arcades. There appears also in England a fatal lack of confidence in this material. This is well illustrated in the porch of Bures St. Mary, Suffolk.

The porch at Sandon is completely brick—arches, tracery, parapet and vaulting.

Towers.

The same church possesses one of the finest brick towers in the country, with magnificent crosses in vitrified headers; over the belfry is a curious brick dome.



ST. MARY THE VIRGIN, INGATESTONE, ESSEX.

An equally imposing brick tower is that of St. Mary the Virgin, Ingatestone, again with fine crosses and four-light west window with brick tracery.

Very similar is the tower of the neighbouring church of Fryering; all have winding stairs in brick. Yet another type of tower is that of Chignal Smealey. This church carries

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the brick idea as far as any village church in England. Even to the font and piscina the complete church is brick.

Ingatestone has also its brick arcade in the chancel.

Great Baddow has a remarkable clerestory with elaborate tracery, brick even to the cuspings and featherings.

(To be continued.)

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

AT the meeting of the Society held on Thursday, November 24, Mr. Arthur Marshall, A.R.I.B.A., gave an interesting account of an Eastertide tour in Spain. Starting at Bayonne, by means of an excellent series of photographic slides, he "conducted" his audience through the picturesque towns of the plateau to the capital. Madrid itself, save in its night life, did not inspire enthusiasm. The interest of the lecture therefore lay chiefly with the districts en route; the snow-capped grandeur of the Pyrenees, the rude charm of the Basque country, the old-world towns with their picturesque gateways and market squares, the gorgeous seaside palaces of San Sebastian—all afforded subjects for picture and discourse, while the national sport was illustrated in a series of views which most realistically suggested the thrilling incidents of the bull fight.

The increasing use of electricity in even the smallest towns was a feature of no small significance, the cables and insulators contrasting strangely with the almost mediæval quaintness of the cottages and crooked streets, while worthy of notice was the architectural consideration with which the plane trees were disposed in avenue and market place, their interlocking branches and dense foliage affording shade and shelter from sun and heavy rain storm.

Mr. Marshall was at the close cordially thanked for his address, on the motion of Mr. Percy Robinson, F.R.I.B.A., and in seconding the vote Mr. H. E. Henderson briefly referred to the architectural interest of many of the slides illustrating bits of the old Spanish towns.

The next meeting will be held on Thursday, December 8, when Mr. Mowbray A. Green, F.R.I.B.A., will lecture on "The Architecture of Bath."

BALLIOL COLLEGE, OXFORD.

By H. W. C. DAVIS, M.A.

BALLIOL COLLEGE is the monument of an ecclesiastical penance which was imposed, about the year 1255, on JOHN DE BALLIOL, the lord of Barnard Castle and father of the claimant to whom EDWARD I. awarded the Crown of Scotland. The elder John had committed grievous wrongs against the see of Durham. For this he was brought to account by Royal intervention, and one of the proofs of contrition which the bishop exacted was that the penitent should maintain sixteen poor scholars in the University of Oxford. In 1266 these pensioners of Balliol were living in a hired house on the present frontage of the College, facing the street now called "The Broad," but then known as Canditch Street because it skirted the city ditch. After JOHN'S death his widow, the Lady DEVORGUILLA, bought three tenements for the perpetual use of the Balliol scholars, endowed them with lands in Northumberland (which the College still possesses), and framed a code of statutes for their governance (1282). This document, with the seal of the co-foundress attached, is in the College archives; they also contain a letter in which she further explains her schemes for the welfare of the scholars. Their number was fixed at sixteen. Discipline was in the hands of a Principal, whom they elected from their own number; but the estates were placed in the hands of extraneous Proctors or Visitors, of whom one was always a Franciscan friar from the Oxford convent of the order. In 1340 the constitution was modified by another notable benefactor, Sir PHILIP SOMERVILLE, who instituted the office of Master (to be held by a graduate), increased the number of scholars to twenty-two, and provided that six of these should always be allowed to continue in residence after graduation. Thus arose the distinction between graduate Fellows and undergraduate scholars of the College—a distinction which is, however, ignored in the formal style of the College, "The Master and Scholars of Balliol." The Commoners, the most numerous element in the modern College, do not seem to make their appearance before the fifteenth century. They were then admitted as private pupils of the Fellows, who supplemented in this way their scanty allowance from the corporate funds. A new code of statutes was drawn up in 1507 by Fox, Bishop of Winchester; he was commissioned to do this by Pope JULIUS II., at the request of the College. Under Fox's statutes the College remained till the era of University Reform began in 1854.

Before the nineteenth century Balliol was a poor foundation, although from time to time the revenues were augmented by gifts and bequests. The number of the residents was small, the buildings from the Restoration onwards were in a dilapidated condition. The back quadrangle was an open space, largely covered with trees and containing only one or two insignificant blocks of rooms. Still, the earlier annals of Balliol yield a respectable and varied list of eminent *alumni*. It begins with JOHN WYCLIFFE, who was Master in 1360-1; though his 'portrait" in the New Hall is a transparent imposture, his active interest in the administration of the College is attested by documents preserved in the archives. Among later names may be mentioned those of Cardinal MORTON, the counsellor of EDWARD IV. and HENRY VII.; ROBERT PARSONS, one of the chief organisers of the Jesuit propaganda under ELIZABETH; Archbishop ABBOTT, the opponent of LAUD; JOHN KYRLE, "the Man of Ross," whose loving-cup is among the chief treasures of the College plate-chest; JOHN EVELYN, the diarist; ADAM SMITH, perhaps the most distinguished of the many Snell exhibitioners who have come to Balliol from Glasgow; and ROBERT SOUTHEY, who once entertained COLERIDGE in a now demolished set of undergraduate rooms. Of the many distinguished men who have issued from the Balliol of PARSONS, JENKINS, and JOWETT (the three reforming Masters of the nineteenth century) it is impossible to speak in the compass of a short article. The memorial tablets in the New Chapel and the portraits in the various public rooms of the College should be studied by those who desire to learn the great names of the more recent past.

The larger part of the College has been built in the last hundred years. But on the west and north-west of the front quadrangle the visitor will find, closely massed together, what remains of the buildings constructed in the fifteenth century by a series of energetic Masters and liberal benefactors. The great oriel of the Masters' dining-room was a gift from GEORGE NEVILLE, Archbishop of York and brother of WARWICK the Kingmaker, who graduated from Balliol in 1452. The dining-room itself is lofty, well-proportioned, and older in appearance than reality. In its present form it dates from the beginning of the nineteenth century. There is reason to think that it represents the original chapel of the College, which was built in 1327, but superseded in 1529 by a larger edifice on the site of the existing chapel. The dining-room points east and west; at the east end, in the bay of the oriel window, there is a raised dais; on each side of the dais, behind the panelling, are very ancient stone walls with fragments of sedilia. Of the Tudor chapel nothing remains except some stained-glass windows (sadly mutilated), which may be seen in the Old Hall and the New Chapel; some oak panelling in the New Common Room; and a part of the carved wooden screen (given in 1635), which may be seen at the east end of the Old Library.

The Old Hall, next to the Master's Lodgings, is a heavy buttressed building, with a low-pitched roof and a machicolated parapet. It dates from the middle of the fifteenth century, but has suffered architecturally from modern restorations and improvements. Most of the mischief was done by WYATT, who was set to work upon it in 1794. He destroyed the old roof and substituted a chimney for the opening through which the smoke of the old central hearth escaped. Since 1877 the interior has

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been further modified by the introduction of bookshelves and the other paraphernalia of a modern library. The modern stained-glass windows at the north end are probably unique in their ugliness. The Old Library, on the other hand, though also restored by Wyatt, still retains much of its original beauty. It is exceptionally long in proportion to its width; the eastern half was built as an afterthought in the latter part of the fifteenth century. The modern bookshelves have been so arranged as to emphasise the length of the room; and the successive restorers of the mullioned windows have been careful to preserve the few armorial shields which survived the dilapidations of the Restoration period. The Old Library possesses a peculiar treasure in the manuscript collections of Gray, Bishop of Ely, which passed to the College at his death (1478). Gray, who visited Italy in his youth, was one of the earliest English patrons of Renaissance studies, and his collection is a typical humanist's library. Beneath the Old Library are two chambers (now completely modernised) which served as common-rooms for the Fellows before the New Hall was built. One of these has a carved wooden mantelpiece of the school of Grinling Gibbons; the other contains an interesting selection of books from Jowett's library.

The newer buildings in the front quadrangle call for little notice. The New Chapel (1856-7), a memorial to Dr. Jenkins, is an early example of the style of Mr. William Butterfield, and chiefly interesting for the associations which have gathered round it in the course of half a century. The south and east blocks, designed by Mr. Alfred Waterhouse (1867-9), are in a mixed Gothic style, and distinctly too high for the quadrangle that they overshadow. The buildings which they have replaced were of the reign of Henry VI., and much resembled the front of All Souls; they were beautiful in design, but much decayed, and extremely inconvenient for the purposes of a modern and densely populated college.

In the back quadrangle the oldest block is that known as the Bristol Buildings, in the south-west corner. It was built in 1700 to accommodate the exhibitioners of the city of Bristol, who in the end were sent elsewhere. Between the Bristol Buildings and the Master's house are the Fisher Buildings, which date from 1769 and were restored in 1877. They were the gift of a former Fellow, by whose ghost they are still said to be haunted. On the north front, facing the quadrangle, they bear the legend "Verbum non amplius Fisher," which has been made the burden of a popular college song. To the north the Bristol Buildings are continued in uniform style by the Basevi Buildings (1825); beyond these are the more ambitious Salvin Buildings (1855), which are chiefly remarkable for a handsome gate-tower. At the extreme north-west of the college is a minute courtyard, bounded on the east by a timber-framed house with gables. This has been converted into undergraduate rooms, and is pierced by an archway leading to the garden quadrangle; its history is unknown, and it was only acquired by the College in 1872. Facing it on the west and north sides of the courtyard are the most recent, and by no means the least successful, of the modern buildings (1905); they were designed by Mr. E. P. Warren, who has embodied in the St. Giles' front some characteristic features of the eighteenth-century house which stood on that site. It only remains to mention the New Hall by Waterhouse (1877), in the Decorated style, the most important of the many schemes for the enlargement of the College which were planned and carried through by Jowett. The lower storey is occupied by the kitchen, buttery, and new common-room; the dining-hall itself is approached by a lofty flight of steps from the central path of the garden quadrangle. Until the present year the interior of the dining-hall presented a bleak and cheerless appearance, in spite of its magnificent proportions. This was due to the insufficiency of the panelling and to the excessive size of the windows, which were planned with more regard to external effect than the comfort of those by whom the hall is used. These defects are now remedied by the generosity of Mr. Robert Younger, K.C., at whose expense the hall has been lined with new panelling, which was designed by Mr. Paul Waterhouse, M.A., a former student at Balliol College, and which we illustrated last week.

ILLUSTRATIONS.

CHURCH OF ST. MARY, NEWINGTON, KENT.

THE earliest existing portions of this church are the chancel and the sacristy, both of Transition period, and each succeeding period is represented in some part of the structure. A fine Perpendicular tower rises to a height of about 80 feet and communicates with the nave by a lofty arch. The effect of the spacious interior is injured by plaster ceilings which conceal the trussed-rafter roofs. The roof of the south chapel has boldly carved and moulded plates and tie-beams. The church contains considerable remains of good woodwork, of which the most important are the parclose screens on south side of chancel, of which the main framework is of the Decorated period and very boldly moulded; the tracery, however, is thin and somewhat clumsy, and has probably been renewed in comparatively recent times in imitation of the original form. Of the very rich late fifteenth-century rood screen only a few fragments remain. The stalls retain two finely carved poppy-heads somewhat mutilated. The font has a tall cover, with doors opening for access, of early Renaissance work, surmounted by a canopy made up of fragments of earlier work, probably from the destroyed rood screen. A richly carved panel of Renaissance period is fixed against the east wall of south aisle. The east wall of north aisle was painted with a "Last Judgment," which is fairly well preserved, and this was probably part of a complete decorative scheme, of which many traces are visible, and of which probably much more remains under a coating of whitewash. The church was surveyed with a view to restoration by the late Mr. James Brooks in 1900, and part of the work has been carried out by his successors, but much is still needed. The latest work executed was the restoration of the parclose screens, which was undertaken by the authorities of Eton College as patrons of the benefice. The contractor was Mr. J. M. Stewart, of Sydenham.

OXFORD COLLEGE SERIES.—BALLIOL—VIEW FROM BROAD STREET—VIEW FROM GARDEN.

AN historical account of Balliol College is given this week, and the views herewith are part of the series of that College, which we shall continue in subsequent issues.

ST. PAUL'S CHURCH, WEST EALING.

THIS church, erected in West Ealing at a total cost of 9,000*l.*, was designed to accommodate 800 persons. Externally the building is faced with stock bricks having Bath stone dressings; internally, similar stone dressings are used, the flat surfaces being treated with grey siripite plaster. The walls of aisles and morning chapel are panelled to a height of 12 feet and coloured olive green. The pulpit, reading-desk and choir stalls are of oak, and the remaining joinery of pitch pine. The design is of simple character, relieved by the tracery of windows, and a dignified effect is obtained by keeping the aisles lofty. The contractors were Messrs. Kingerlee & Sons, Oxford; the glass was executed by Mr. W. Smith, of Balcombe Street; and the heating and ventilation was carried out by Messrs. Russell & Co., Lancashire Court, New Bond Street.

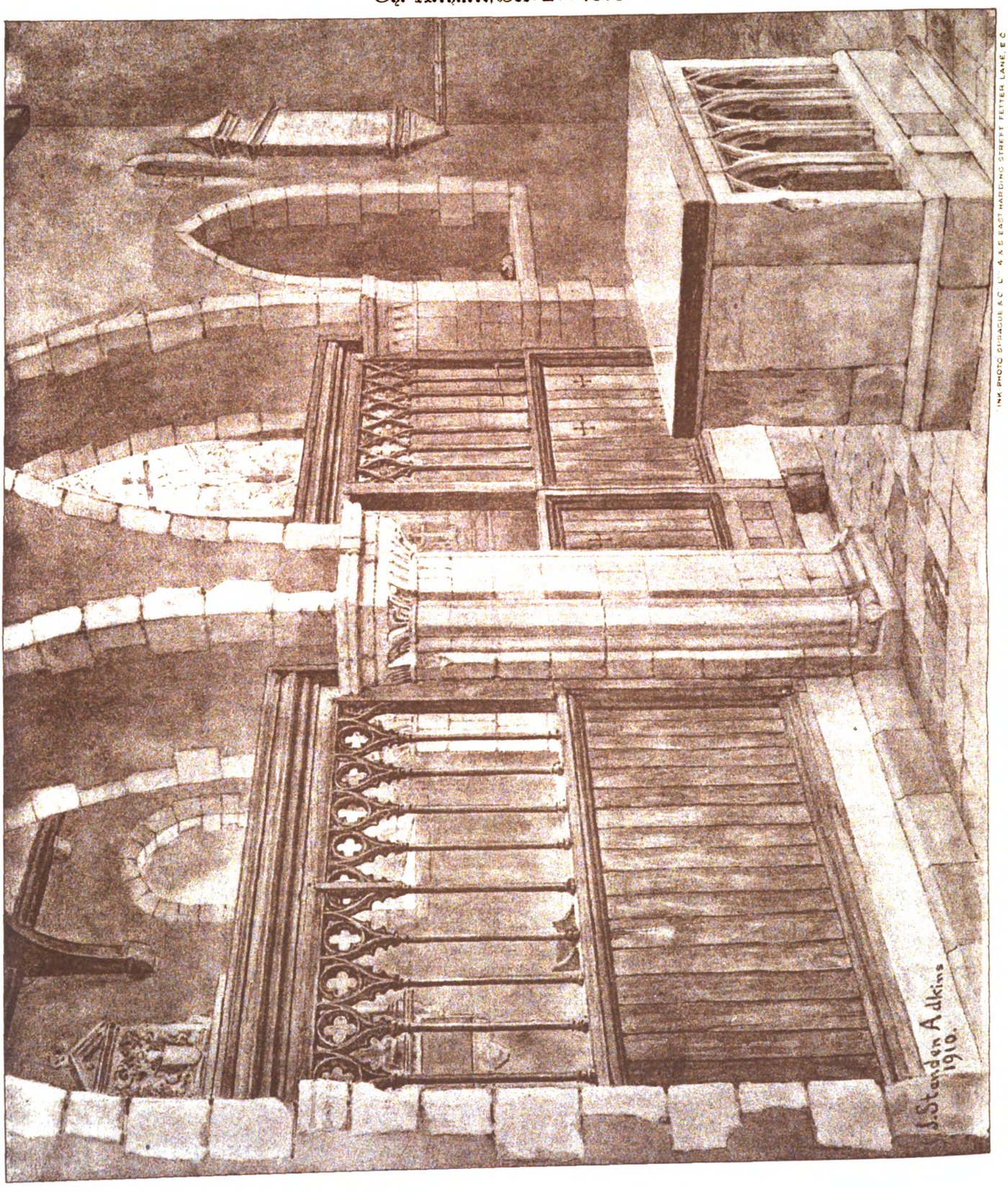
SHOPS AND DWELLINGS, EALING.

THESE premises, which have been erected in Uxbridge Road, Ealing, for Mr. Robert Sortwell, contain three shops with dwellings over. The roofs are covered with green slates and the elevations faced with red bricks and terra-cotta, the latter being carried out by Messrs. Doulton & Co. The building contractor was Mr. Walter Dicken, Ealing.

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RESTORATION OF PARCLOSE SCREENS, ST. MARY, NEWINGTON, KENT.

MR. J. STANDEN ADKINS, Architect.

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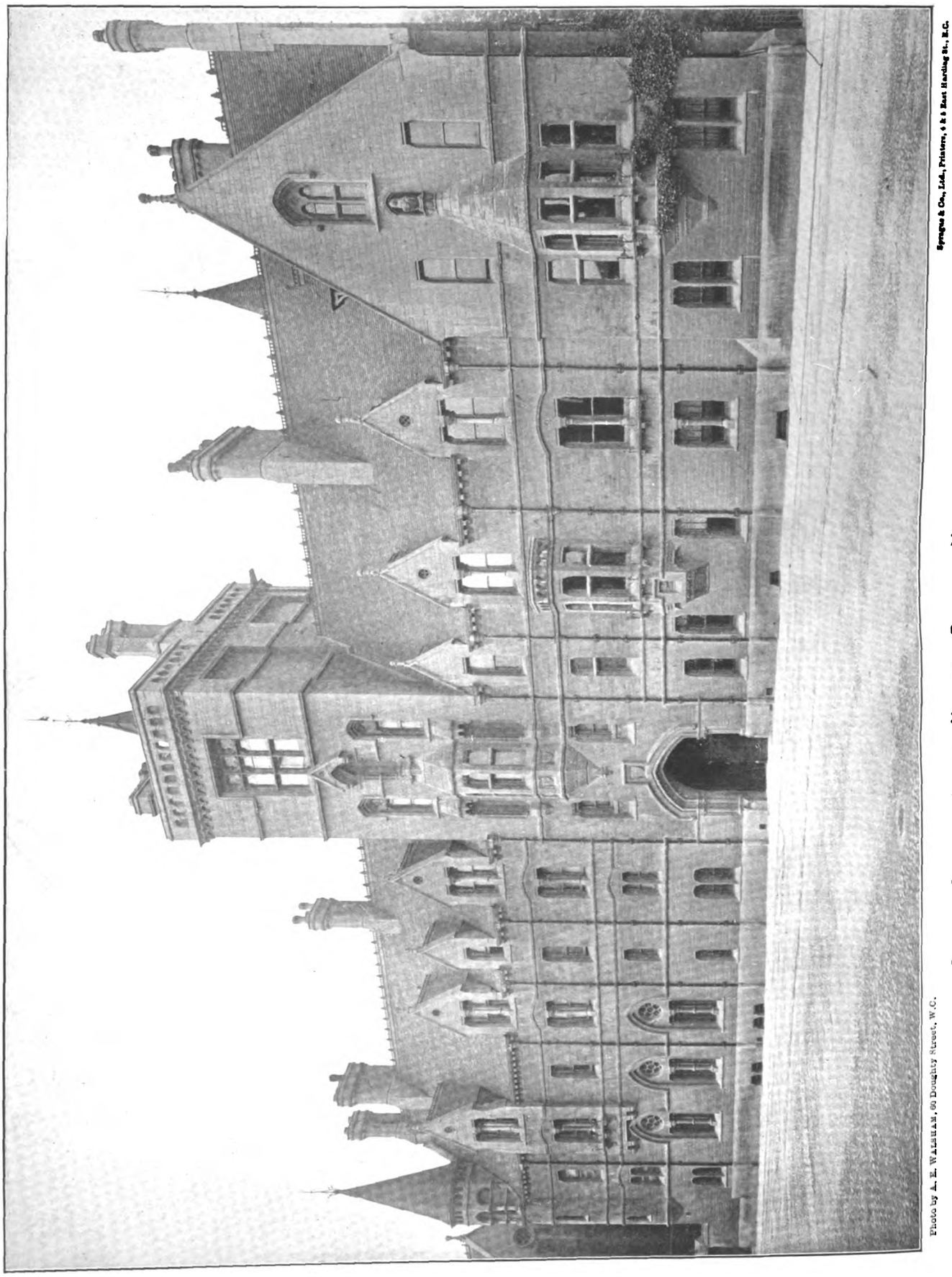


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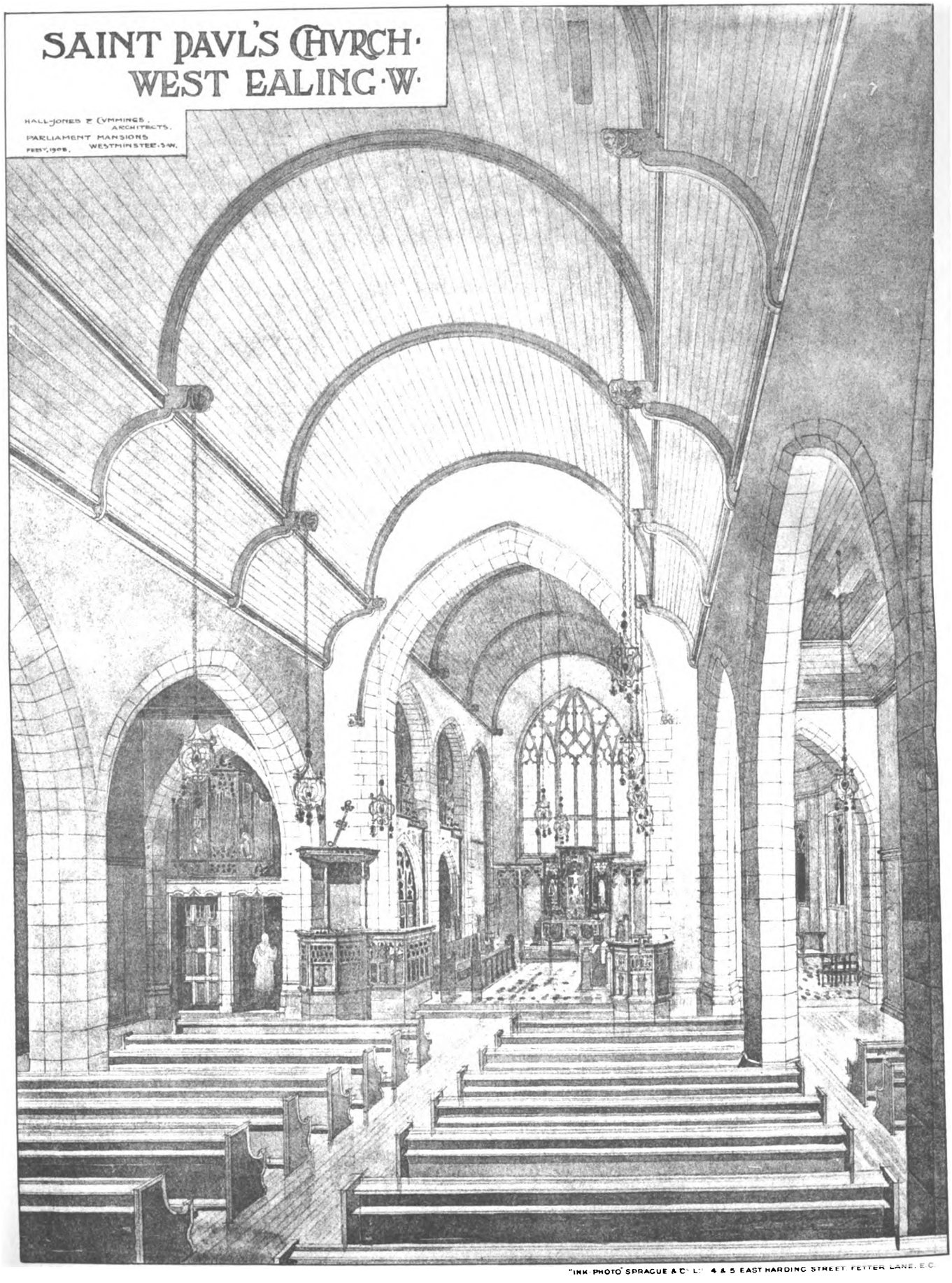
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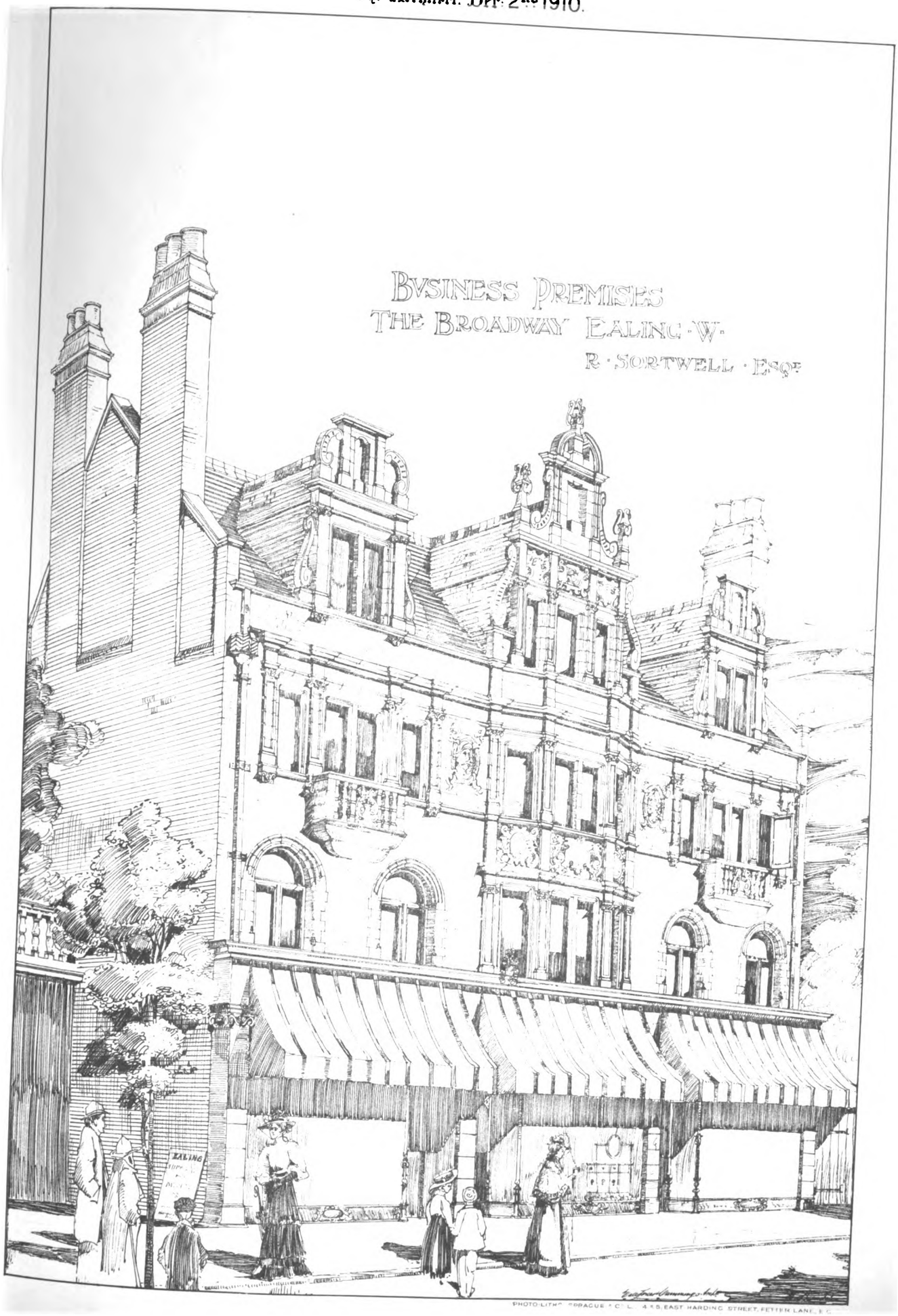
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St. Paul's Church, West Ealing, W.

Messrs. HALL JONES & CUMMINGS, Architects.

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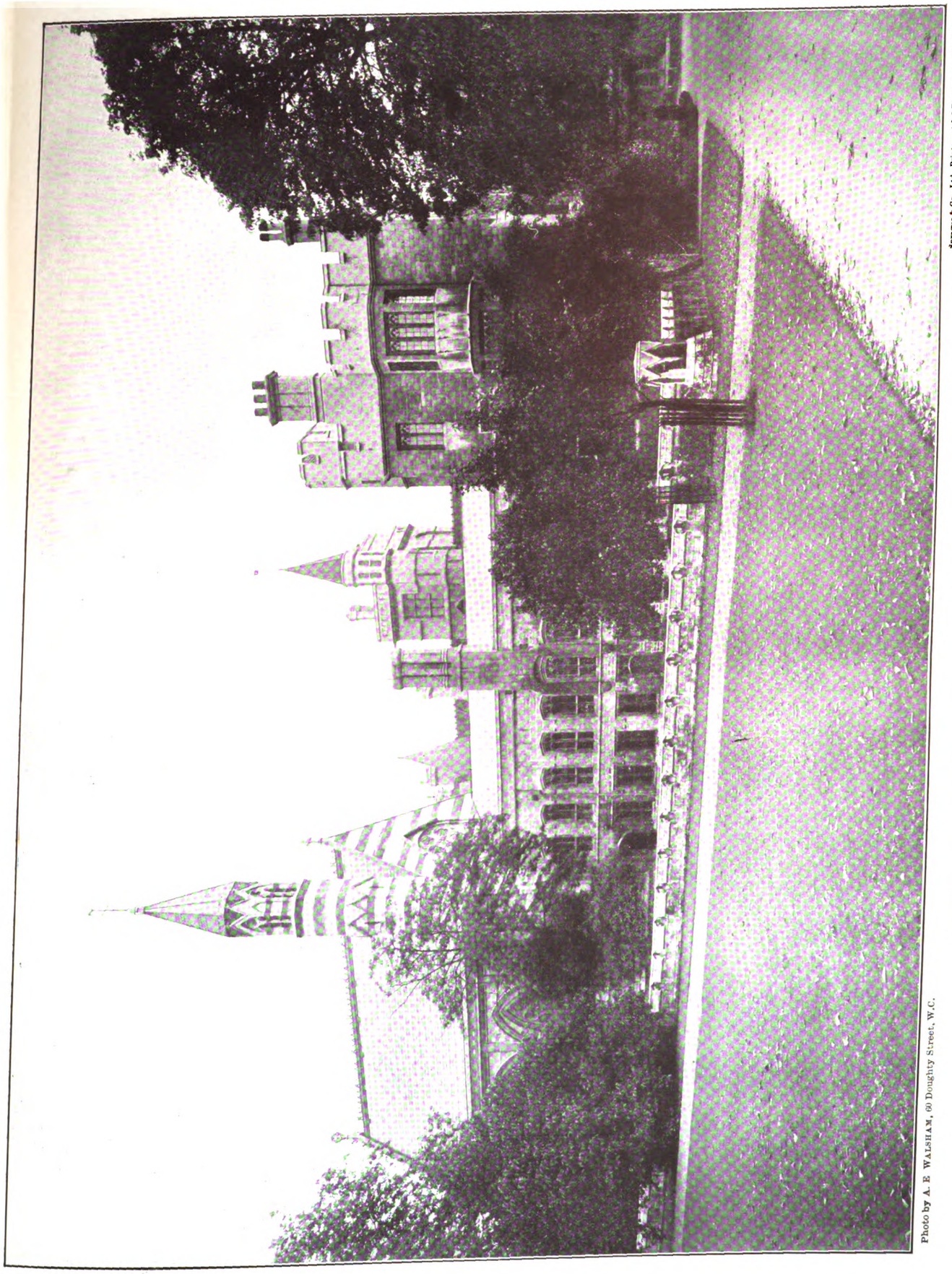
Business Premises, Ealing, W.

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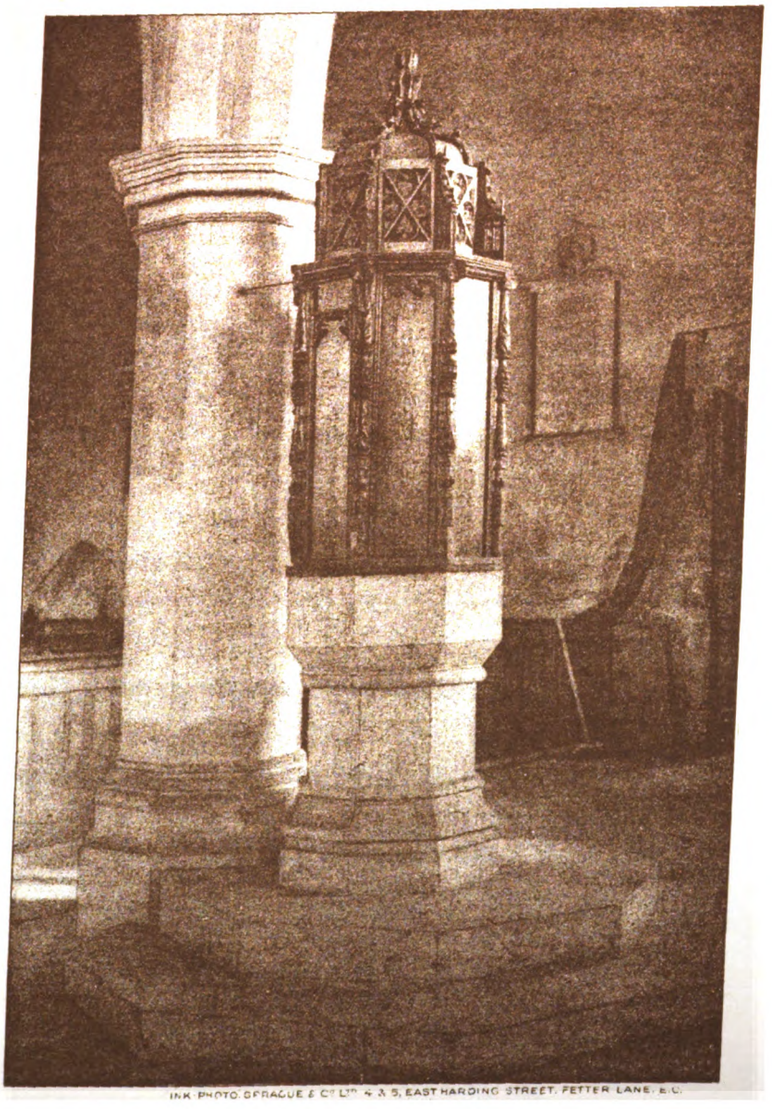
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INTERIOR VIEWS IN CHURCH OF ST. MARY, NEWINGTON, KENT.

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PETROL AIR-GAS.

THEORY AND PRACTICE OF THE NEW ILLUMINANT.

By Professor C. A. M. SMITH, M.Sc.

(*Continued from page* 331.)

THE "*National*" plant, illustrated in fig. 11, consists of the following main parts:—There is a hot-air engine driving a blower A. From this air passes along a pipe which branches in two directions—B and C. The portion of air passing along B goes through a valve at D into a mixing chamber E, and then direct into the gasholder.

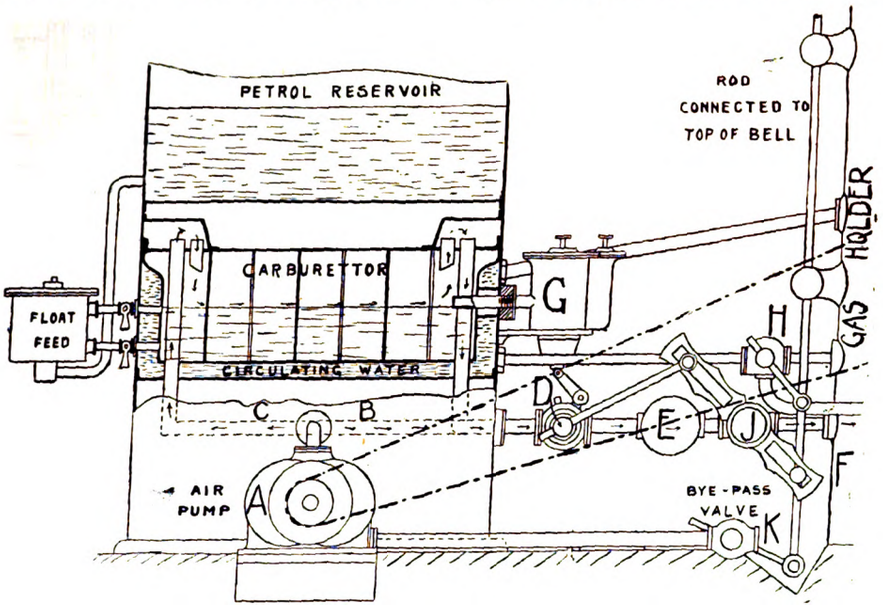


FIG. 11.

The portion passing along C enters a carburettor (as shown), and hence to another valve immediately behind D, also into the mixing chamber E to the gasholder. The general design of the carburettor and the method of keeping a constant supply of petrol will be obvious from the diagram. It will be observed that the carburettor is jacketed by the hot circulating water from the hot-air engine. G is a thermostat for keeping the mixture constant owing to variations in the temperature. On a rise in temperature the mercury expands and forces up diaphragm head and lever, which opens inner plug of twin plug air valve D sufficiently to pass the additional supply of air required. When temperature falls the reverse actions take place. The other levers shown in the diagram are worked by a connection to the top of the gasholder, which is of the ordinary displacing bell type. When the bell gets to the top of its stroke a valve J cuts off the entire supply to the gasholder, while a by-pass valve K is opened, allowing the air being pumped by the blower A to escape direct into the atmosphere. Like most other modern plants, the proportion of vapour to air is about 1½ per cent. of the former to 98½ per cent. of the latter. It is also noteworthy that, owing to the artificially heated carburettor, it is possible to use a heavy grade of petrol (density about 0.760), which is correspondingly low in price. According to a report on this apparatus by Mr. ALBION T. SNELL, M.I.C.E., M.I.E.E., 1,840 cubic feet of gas were obtained per gallon of spirit, and 10 candle-power per cubic foot per hour was obtained in the burners—*i.e.* 18,400 candle-power hours from one gallon of ordinary "Shell" petrol (density 0.7215 and 0.725).

The following condensed descriptions will indicate the principles of some of the other leading plants:—

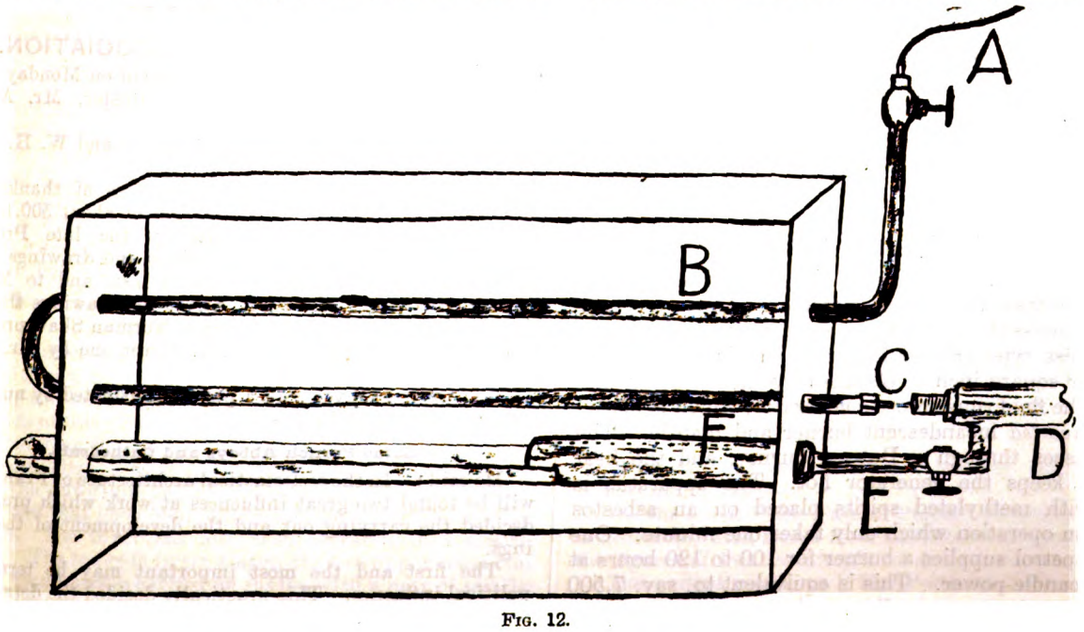


FIG. 12.

Non-explosive Gas Company's Plant.—A hot-air engine drives a rotary pump or blower, which pumps air round the jacket of the hot-air engine to the carburettor. The latter consists of fine wire gauze and has no moving parts. The mixture passes through an ordinary wet gas-meter, the rotation of which causes petrol to drop in measured quantities into the carburettor. The gas passes

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to an ordinary bell holder, whose rising and falling govern the speed of the engine. One gallon of petrol makes 1,000 cubic feet of gas.

"*Praed*" *System.*—A hot-air engine drives an apparatus like a reversed wet gas-meter in paraffin. This pumps air into a carburettor, which is supplied with petrol by a small positive pump driven off the same gearing as the air-blower. The rise of the holder opens a valve and allows the air to blow to waste. The percentage of vapour is rather higher than in the usual type, so that the ordinary Welsbach Kern burners can be used.

"*Eos*" *System.*—This is driven by weights and requires winding twice a week. The air is pumped as in the "Safety Light" plant, but the petrol floats on water, as in the "Centenary." A measured quantity of petrol is dropped in each revolution. It is claimed that by keeping the air very wet a constant temperature is ensured.* The proportion of vapour is high in this plant (about 5 per cent. vapour to 95 per cent. air); hence extra air is required in the burners. One gallon of petrol is said to make 860 cubic feet of gas, though this is somewhat inconsistent with the percentage of vapour stated above.

The "Pharoso" System.—This is illustrated in fig. 12, and, as will be seen, works on an entirely different principle from those previously discussed. Petrol under a pressure of about 15 lbs. per square inch is forced along a pipe, A, whence it enters a coil, B, enclosed in a box. This coil is heated by a burner, F, with the consequence that the petrol practically boils and escapes in the form of vapour at a fine nozzle at C. Here we have a similar contrivance to that employed in a Bunsen burner, air being sucked in with the vapour and forced into the gas main at D. The necessary heat is supplied by the burner F from a by-pass at E. This is probably the simplest of any of the plants described, but has one rather serious disadvantage. There is no automatic means of regulating the exact supply to the vaporiser according to the number of lights working. Consequently it is necessary to fit a kind of safety-valve on the system, so that when the pressure rises beyond a predetermined point this valve opens and allows gas to escape into the open air outside the building. Otherwise the apparatus certainly works very well.

The "Sulox" Apparatus.—In this system, which is also different from the general run of plants, the compressor is quite separate, and transmits air, if necessary, over long distances. This air is brought to the generating apparatus, where it passes through a wet meter, from which it enters a drying chamber and then into the carburettor. The latter contains a sphere, over which the petrol is passed from a pump worked by the rotation of the meter. There are a number of deflecting vanes in the carburettor, which set up a swirling motion and ensure that the whole of the petrol shall be vaporised. The carburettor is surrounded by a radiator and anti-freezing liquid.

Direct Petrol-supply Types.

The "Invetrol."—The petrol is supplied through a fine seamless brass tube ⅛ inch diameter. In the original system the pressure was derived simply by gravity feed. In the latest type (Pitner-Invetrol) an air pressure of 10 lbs. per square inch is obtained by means of an air-pump. The fluid runs across a generator, which is placed over an *inverted* incandescent burner and mantle. The vapour passes through a Bunsen burner, and the heat developed keeps the generator hot. The apparatus is started with methylated spirits placed on an asbestos square—an operation which only takes one minute. One gallon of petrol supplies a burner for 100 to 120 hours at 70 to 80 candle-power. This is equivalent to, say, 7,500 candle-power hours per gallon.

The "*Carmien*" is largely used in France and, since 1902, in England. The liquid is vaporised as in the "Invetrol" system, the pipe being 3 mms. diameter. *Upright* burners and mantles are used.

The County Plant.

This is a weight-driven plant of simple construction, shown in fig. 13. A is a vertically reciprocating petrol pump. B is a vertically reciprocating air-pump directly connected with A. These two pumps are actuated together by the fall of the wound-up weight, stroke for stroke. Their relative sizes determine the proportions

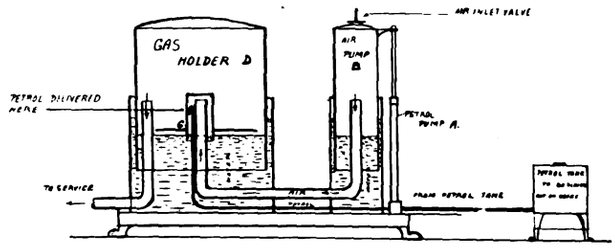


Fig. 13.

of air and petrol delivered, and their inter-connection ensures the constancy of the resulting gas, as air cannot be delivered without its complementary charge of petrol, and *vice versâ*.

The air passes through a water-seal (forming a non-return valve) and is delivered with the petrol into the carburettor C. The carburation takes place on the surface of a large bulk of water.

D is a gasholder. Into this the mixed air and vapour pass. This gasholder both governs the pressure of the gas and controls the working of the weight motor. When it is full it cuts out the action of the weights, and when it is depleted to a certain points cuts the weights in again, and so is refilled by the pumps. The manufacturers insist very strongly on the use of a comparatively rich gas (6 to 7 per cent. of petrol vapour), as by so doing they seem to think that they secure an advantage when they have in the pipes and apparatus a gas which will not support its own combustion; but too much attention should not be paid to this matter of richness of gas, as there should be no danger with any mixture if the burners are properly designed. With some plants an inflammable and explosive gas is present throughout the system.

(*To be continued in our issue of Dec.* 16.)

* There seems to be considerable difference of opinion as to whether the air should be dry or wet. It will be remembered that in the "Safety Light" plant, and in others, special precautions are taken to dry the air.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Monday evening last at Tufton Street, Westminster, Mr. Arthur Keen, President, in the chair.

Messrs. A. G. Shoosmith, P. B. Tubbs, and W. H. Webb were elected members.

On the motion of the President, votes of thanks were passed to the R.I.B.A. for a donation of about 300 lantern slides bequeathed to the Institute by the late Professor Aitchison, to the exhibitors of etchings and drawings at the Conversazione held on November 23 last, and to Mr. R. Norman Shaw and Mr. R. S. Street for drawings they had given to be hung in the School. Mr. Norman Shaw presented two of his own drawings and Mr. Street one by Mr. R. E. Street.

Mr. Andrew Oliver read a paper, illustrated by numerous lantern slides, entitled:—

Some French Abbeys and Cathedrals.

He said:—In the ecclesiastical architecture of France there will be found two great influences at work which practically decided the carrying out and the development of the buildings.

The first and the most important may be termed the political influence. This practically decided the detail of the architecture, which varied according to the province in which that particular type took its rise. So much so was this the case that we find each district or province possessing its own type of the Romanesque. Each province worked out its buildings with one style, but only up to a certain period, and that coincided with its absorption into the "Domaine Royale." In some instances it took place comparatively early, in others not until the days of the Renaissance period.

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As regards the second influence—viz., the ecclesiastical—we find it in the plan of the buildings and not in the construction, the construction being carried out according to the ideas prevailing at a particular time in a certain district. The clergy, whilst insisting upon one system being carried out, left the details to be worked out in that type with which the people were best acquainted. The monasteries of Vezelay, Paray le Monial, and La Chante sur Loire, all belonging to the monks of Cluny, show the distinguishing feature of the narthex or western porch, and used solely by this Order. The architecture, it will be noted, varies according to the locality.

Vezelay.

The construction of the porch at Vezelay is certainly one of the most remarkable works of the Middle Ages. The porch is closed, and shows an ante-church (about 75 feet by 63 feet) within the walls.

The plan shows a nave and two aisles with galleries over the aisles. These galleries are entered by staircases built within the walls. Three openings are placed above the entrance arch, which open into the church, an altar being placed in the centre. The figure of Saint Mary Magdalene anointing the feet of Our Lord, and the resurrection of Lazarus appear on the lintel, and Our Lord with the twenty-four Elders and the Elect in the tympanum of the entrance arch inside the church.

The tympanum inside the porch shows Our Lord sending the Apostles; on the lintel upon the left side figures bringing cattle and other goods, and on the right a battle appears; these were to commemorate the continual strife between the Counts of Nevers and the peaceful tenants of the abbey. On the centre shaft a figure of Saint John the Baptist with the Holy Lamb upon a disc.

The exterior shows three porches, the central one containing figures in the tympanum. Over the central porch a window of five lights, with statues upon the mullions placed under canopies, above the windows a figure of Saint Mary Magdalene, with two figures on either side. The southern tower is crowned by a battlement; that on the north side ends abruptly. The date is about 1230 to 1240.

The nave, consecrated in 1104, is in black and white stone. The chancel is of thirteenth-century date.

The detail of the front of the second church at Vezelay, St. Pere, is similar to the front of La Madeleine—in the figure placed under the gable, but with a rose window underneath.

The narthex likewise shows it to be similar in plan, but here we find the altar placed against the north door instead of its being inside the church. Traceried windows are on the north and south sides. The interior shows a church of smaller dimensions.

Paray le Monial.

Viollet Le Duc considers the porch to be earlier than the building it is attached to. The western front shows the porches carried in the towers. The towers in five stages with round arched openings. The nave of three bays. The central tower octagonal, in two stories, the upper with open and the lower with blank arches. The transept shows five windows. The east end is a typical example of the style. The clearstory windows with circular hood moulds carried on shafts. Beneath these five windows with slight pilasters. The apsidal chapels similar in detail to the clearstory. The southern porch is of a much later date than the rest of the building.

La Charité sur Loire.

The church was commenced in 1056 and completed in 1107. It consists of a north-western tower, the remains of a narthex, the nave, transepts, chancel, apsidal chapels, and fragments of other buildings formerly belonging to it.

On entering by the western porch, of fifteenth-century date, the vaulting shafts and portions of the original mouldings of the triforium and clearstory are to be seen, mingled with houses that have been built upon the site of the narthex or porch. The tower has also been degraded in a similar fashion. The tower is in six stages, the two upper consisting of three round arches carried on shafts, with a pair of smaller arches; underneath the third stage a row of arches of a chevron pattern. The interior was evidently vaulted, as we see the remains of a vault with three open arches, a row of smaller arches with capitals underneath.

The central tower is an octagon with statues placed under the arches in the top story.

The chancel and transepts show a blind story over the clerestory windows, a second row of arches being under the transept windows. The interior shows pointed arches round the apse; the capitals are boldly carved with arches similar in design to those of the tower. The tympanum of the western porch is now placed on the south-eastern wall of the transept. It consists of the Transfiguration with the figures of Moses and Elias on either side, and those of the three Apostles. Upon the beam underneath, "The Presentation in the Temple" and the "Three Magi Kings."

Saint Jean des Vignes, Soissons.

All that now remains of the Abbey of St. Jean des Vignes, Soissons, is the west front, the dormitory, the refectory, and the west and south walks of the cloisters. The abbey buildings were destroyed at the Revolution of 1793, and it is only by an engraving in the "Monasticon Gallicanum" that we are enabled to see the extent. The abbey was surrounded by a wall with towers on three of the sides. The entrance was through two gateways. The abbot's house stands next to the great gateway, which gave access to the parvise. The western front consists of three magnificent porches, the tracery destroyed, with towers at the north and south. Under the centre gable a round window in which were three round arches with traced heads; an open gallery is to be seen across the whole front. The buttresses contain statues, end in pinnacles and canopies.

Within the arch under the spire on the north side, placed upon the mullion, there is a Crucifix, and upon the buttress angles figures of the Blessed Virgin, St. John, and four others. Beneath the Crucifix an open gallery is seen, and there is a similar one on the south side. The spires are different both in the design and in the detail, the one on the south is not so elaborate as that on the northern side.

The abbey church consisted of a nave of possibly five bays, with transepts and chancel, the cloisters on the south forming a square, the dormitory buildings being on the farther side, and the refectory on the west; to the south of the refectory the guests' lodgings.

The examples of French cathedrals which will be shown have been selected for the purpose of pointing out some of the different ways in which the planning and other details were dealt with.

The simplest plan of a cathedral shows a nave and aisles either with or without side chapels, transepts, and a chancel in the form of an apse with chapels either circular or radiating from the apse. The latter may be three-sided at the ends, or a greater number, the line of the direction of the chapels being determined by the piers of the apse, which also fixes their number, the space between the piers and the chapels being the ambulatory or passage round the chancel and the sanctuary. Typical examples are the plans of the cathedrals of Amiens, Rheims, Paris, and Chartres, all of which show a similar arrangement in the plan.

The western porches of Chartres are in a class by themselves, as are the great porches on the north and south sides of the cathedral.

The western porches, known as the Porte Royale, show great figures of Kings and Queens of France. The central tympanum containing the figure of Our Lord with the Elders underneath, with the four evangelistic symbols placed round. The tympana of the north and south porches are also filled with sculpture, the beam underneath likewise bearing figures of small size.

A rose window is in the upper part, and two towers crowned with spires are at the north and south sides. The porches on the north and south transepts are similar in design and detail, and consist of arches supported by the figures of saints and other persons.

At Amiens, Rheims, and Paris we find that the features which stand out more than any other are the magnificent western fronts. The same idea runs throughout the series; the great porches filled with statuary, the line of kings over the porches, the great rose windows, and the massive flanking towers.

With but one exception, viz., Rheims, the porches are named as follows:—

On the north "The Saints' Porch," to whom the church is dedicated, with scenes from the life in the tympanum and the figures of local saints placed around the sides.

The central porch, or "The Porch of Judgment," from the Last Judgment, being placed on the tympanum; at Amiens and Paris figures of the Twelve Apostles are placed round the porch.

The south, or "The Virgin's Porch"; the figure of the Blessed Virgin with scenes taken from her life, and various figures connected with her are placed at the sides as Herod, the Magi Kings, Solomon.

At Rheims, the cathedral being dedicated to the Blessed Virgin, the coronation is placed upon the pediment, and

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round the sides statues of the Annunciation, Visitation, and the Presentation in the Temple. The Judgment Porch is on the south side with the figure of God the Father, and upon the northern pediment the Crucifixion. The tympana in these porches are filled with tracery. The Kings placed in the upper portion of the front show the baptism of Clovis by St. Remi.

At the Cathedral of Nevers we find an apse both at the east and west end of the cathedral. The western apse dates from the year 1046, and it is all that remains of the second church, the first being erected in the ninth century. This earlier apse was discovered about four years ago to the west of the present one. In the thirteenth century the church was taken down, but the transept and the apse were left, and a new nave sanctuary erected at the eastern end. The form of this church can be seen from the Church of St. Etienne—which is covered by a barrel vault—and under the vault of the transept shows a row of round arches carried on shafts. A small portion of the nave arches is still left at the west end. In the view of the exterior the apsidal chapels are longitudinal in plan with a hexagonal apse. At Laon we find an unusual form for France of a square east end, the round apse being the usual type. It is said that an English bishop presided over the diocese at that time.

Another equally rare feature to be seen is the south triforium gallery. The chapels in the aisles are also to be noted, as it can be seen that in order to build the chapels the early windows were cut through.

Laon is also remarkable for the six towers, of which only two have spires at the present time, four being placed at the transepts and two on the west front.

The east end of Poitiers is also square. It was rebuilt by Henry II. of England.

The Cathedral of Noyon is remarkable for its circular transepts.

It was commenced in the year 1180 and completed at the end of the twelfth century. The circular transepts were for a remembrance of the Cathedral of Tournay, from which it was separated in the year 1153.

The apse consists of four square and five round chapels, being the oldest part of the church. The churches built at the end of the twelfth century or the beginning of the thirteenth century do not possess chapels at this date, but yet it follows the same arrangement that is to be found at St. Denis.

The chapter-house is placed upon the north side of the cathedral. The great towers and the porch are not of any great interest.

At Soissons we find a circular transept on the south side. It is vaulted in thirteen bays, with a small circular treasury.

Bourges is a unique example of five porches on the western front with two aisles on either side of the nave, the entrances leading into either the nave or an aisle. Chapels are built on the outside. There is no transept, which adds to the great length of 405 feet. The apse ends in small round compartments. A great tower, unfinished, is on the south side.

Albi.

The Cathedral of Albi was commenced towards the middle of the fourteenth century. It is terminated by an apse and surrounded by chapels, which are polygonal in the chevet and square in the nave.

The chapels, which are placed between the buttresses of the vault, are in two storeys, the upper one forming a gallery, entered by a staircase in the outer tower on the north side.

The windows are long and narrow. The construction was stopped at the beginning of the fifteenth century.

At the beginning of the fifteenth century the balustrades were placed on the tower, the work added to the southern tower, and the jube with the stalls erected by Cardinal D'Amboise. The jube is one of the three or four now left in France. The other places where they may still be found are at La Madeleine, Troyes; St. Etienne du Mont, Paris; and St. Florentin, Arques.

Viollet Le Duc describes the jube at Albi as "the largest, the most complete, and the most precious, with an infinite number of statues of delicate outline; it presents one of the most extraordinary specimens of Gothic art."

The jube consists of a rood in the centre with the figure of our Lord, and the Blessed Virgin and St. John on either side, and two other figures placed lower down the shafts, which go down to the ground and form the central portion of the screen. Two compartments of similar design are placed on either side, those on the north and south having doorways. Underneath the vaulting is of an elaborate character.

On the north and south sides of the ambulatory a row of figures divided by traceried compartments, the entrance to the chancel by doorways of a similar design to those in front, round the presbytery the Twelve Apostles, with the Crucifixion in the centre. The stalls, eight in number, show elaborately carved tracery at the back divided by the figures of angels; the whole work, with the exception of the missing statues on the front, is as perfect as when it was first erected.

The PRESIDENT said the lecturer had given them an extremely interesting and fascinating paper, and he had talked in a most instructive way. It had been a real pleasure, the speaker said, to see the illustrations, because he had visited the buildings a number of years ago and the lecture introduced him to them again.

Mr. G. LEONARD ELKINGTON said, as an Association they were under a great debt of gratitude to Mr. Oliver for giving them that most interesting review of some of the masterpieces of ecclesiastical architecture in France. Although the subject had appealed to him in a general way he had no useful remarks to make in relation to it, but he did think from what he had seen that there was no one present who would deny that in the photographs Mr. Oliver had shown them there were elements of a very interesting nature—elements which should be examined rather more closely than they had been up to the present time. Mr. Oliver had taken them so rapidly through a large district and a great period that they had hardly been able to enjoy to the full the beauties of the subjects, but he was sure all would agree that Mr. Oliver was to be thanked for the trouble he had taken in his lecture.

Mr. ELDER DUNCAN seconded the vote of thanks. It was some time, he said, since he had had the pleasure of hearing Mr. Oliver in the Association. On the last occasion Mr. Oliver was much interested in brasses, and he then also proved himself a master of the subject. He agreed with Mr. Elkington that there were in the cathedrals and churches of Southern France a great many elements which were remarkable, and which showed the gradual transition from Gothic to Romanesque, or from Romanesque to Gothic as they knew it in the Northern churches.

Dr. WICKSTEED supported the motion, and cordially invited all those who were interested in the architecture of the churches of France to a lecture on the subject to be given under the auspices of the Ecclesiological Society, at St. Paul's Chapter-house, on December 7, at eight o'clock.

The PRESIDENT, in concluding the discussion, said the thought which had been running through his mind was what bearing the lecture would have on the debate to be opened by Mr. Elkington at their next meeting, entitled "That Foreign Travel and Study Retard the Development of a National Style." They had seen much that evening which might have an important bearing on the question of foreign travel and add some interest to the forthcoming meeting. He had been struck with the character that French architecture showed. All the slides they had seen demonstrated how absolutely right the French were, and illustrated the development of Gothic architecture, tracing it as an example of constructional building. All the elements of Gothic arose out of the difficulties in building, and they could observe how all the stresses and strains in construction were carried to the ground in even lines, and very fine architectural compositions were the result.

The vote of thanks was passed by acclamation.

Mr. OLIVER briefly replied and the meeting terminated.

ENGLISH DOMESTIC WORK.—V.

THE fifth of the course of eight public lectures by Mr. J. A. Gotch, F.S.A., F.R.I.B.A., at University College, Gower Street, W.C., on the above subject dealt with

The Homes of Queen Elizabeth's Courtiers—Interiors.

The big houses of the time of Elizabeth and James, said Mr. Gotch, showed a very marked development in the way of comfort and decoration. Few examples of the interior decoration of the preceding mediæval houses have survived; either these have perished or they have been from time to time modernised. It is known that considerable care was in some cases bestowed upon the adornment of the rooms. Nevertheless, in the boisterous and often dangerous years of our early kings decoration must have been but a secondary consideration. By the time of Elizabeth people had more leisure and more inclination to consider the amenities of life, and more means with which to gratify their inclinations. As on the outside, so in the inside of houses stateliness and display were the ruling factors in their treatment.

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Sir Christopher Hatton finished a splendid palace at Holdenby, in Northamptonshire, about the year 1580. In the previous year it was visited by Lord Burghley, who wrote an account of it. One portion of the letter runs:—"Approaching to the house, being led by a large, long, straight fair way, I found a great magnificence in the front or front-pieces of the house, and so every part answerable to other, to allure liking. I found no one thing of greater grace than your stately ascent from your hall to your great chamber; and your chambers answerable with largeness and lightsomeness that truly a Momus could find no fault. I visited all your rooms, high and low, and only the contentation of mine eyes made me forget the infirmity of my legs." It is clear that Lord Burghley's idea of a house was that it should be not only well planned and well built, but that it should be arranged in a stately manner both within and without, and, in fact, worthy of lodging Queen Elizabeth on her progresses.

Although this particular house has practically disappeared, something of the same sort is preserved in other fine, though not so vast, houses. The great hall remained the principal living-room; it was still entered from a passage through a screen, and it still rose, in many cases, from the floor to the roof. The screen was elaborately carved and adorned with fantastic fretwork, heraldic shields, and other ornament. The open roof was half hidden in the gloom, but the smoke no longer rose from a central hearth to eddy among its timbers, for in one of the side walls was inserted a huge fireplace, surrounded by a chimneypiece fantastically carved and bearing the arms of the owner. At the farther end of the hall there was still the dais with its bay window, which like the other windows, glowed with heraldry. From this end a doorway led to the grand staircase; from the opposite entrance passage doorways led to the kitchen and other servants' rooms.

The college halls very closely resemble those of the large Elizabethan houses. A typical example is that of Wadham College, Oxford (1610-1613). It has a lofty open roof; the windows are fairly high up and have a curious and characteristic version of Gothic tracery which is no longer Gothic. Below the windows the walls are panelled, and above and around them they are plastered. The screen has the customary two doorways and fantastic fretwork on the top. The hall of Trinity College, Cambridge, was built about 1604-1605, after considerable thought, for a small committee had been sent from Cambridge to see some of the large halls in various parts of the country, including the exceptionally fine one in the Middle Temple. The heraldic glazed windows lend a very great deal of charm and romance to this and other halls. At Hatfield there is the unusual feature of a second screen at the dais end, but this may not have been contemporaneous with the hall. There is the customary bay window at the dais end, though there could not have been a raised dais. Over a flat ceiling are the third-floor rooms: usually there were only two storeys to a hall, and communication between the upper rooms of the house separated by it was impossible. [Other screens at Knole, Bramshill, and Longleat were described and illustrated by lantern views.]

The long gallery was a feature very characteristic of the houses built in the reigns of Elizabeth and James. The first one recorded was Hampton Court, in the time of Henry VIII. During the time of Elizabeth and James they were introduced into practically every house. The plans were arranged so as to give the maximum length possible; they were 180 feet, 200 feet, or even longer. Their width varied from 18 feet to 24 feet. That at Haddon is about 110 feet in length. The wall-panelling at Haddon is charming and of an unusual design. The ceiling was of a simple kind, and includes amongst its plaster decoration a shield showing the alliances of Vernon and Manners. This and other evidence shows that there is not an atom of foundation for the romance about Dorothy Vernon escaping from the long gallery while a ball was in progress and eloping with her lover, who waited below. The gallery must have been built between 1567 and 1584, and subsequent to their marriage. In fact, it is doubtful whether Dorothy Vernon had even seen such a thing when she was a girl. The Long Gallery at Knole dates from 1605, and likewise has delightful panelling, a deep frieze, a simple but bold ceiling, and two fine marble chimneypieces without heraldry. The existing furniture is of interest, all of it being old, though not contemporaneous with the hall. The ceiling of the long gallery at Charlton, Wilts (1607), does not follow the formal pattern, the design being of strapwork with small pendants. Here the windows only go down one side and at each end. The verse over the chimneypiece at Apethorpe shows that one reason why this long gallery was built was for the purposes of music. Another reason was to afford facilities for exercise in inclement weather.

The Great Chamber was almost always upstairs. It served as a large reception-room, and was the predecessor of the present-day (with)drawing-room. There are two such apartments at Bramshill.

This great chamber was reached from the hall by means of a staircase. Prior to the time of Elizabeth the only staircases known were the round ones of stone such as are found to-day in churches. The early Elizabethan staircases were very simple in construction, though elaborately ornamented, being simply step-ladders from landing to landing. The effect of the one at Hatfield is extremely handsome with its carved balusters, newels with their figures, handrail, and dog gates. At Blickling the staircase divides right and left at a short distance from the floor level in a manner which is common now.

The early chimneypieces were merely the ornamental treatment of the space surrounding the fireplace. But in Elizabethan times they became separate features, most of them being movable. Quite an early example is at Boughton House (1550), with its curious mottoes of "A thousand griefs to one pleasure" and "Be not Argus-eyed abroad and like a mole at home." Another at Trerice, Cornwall, dates from about 1573, and has a Gothic opening for the fireplace with a Classic overmantel. Other notable chimneypieces are at South Wraxall, Burton Agnes, Hatfield, and Apethorpe.

The ceilings developed from those earlier in the century, and they showed a peculiarly English vernacular. They were executed in all the stages between the very simple and the very elaborate.

The more usual Elizabethan mode of wall decoration was wood panelling—or, at any rate, that is the method of which most examples have survived; sometimes they were covered with tapestry, the "costly cloths of Arras and Tours," with their extraordinary mixture of subjects. The panels were usually plain, although occasionally inlaid with wood in delicate patterns. The mouldings which surrounded them were generally narrow. In later years, however, the panels were arched, and at the sides imitation pilasters were introduced; all the surface of the work became ornamented, while the filling of the panels themselves was plain.

There was, said Mr. Gotch in conclusion, nothing archaic about the decoration of Elizabethan and Jacobean houses; indeed, it attained as high a standard as that of to-day. Vast strides were made in advance of anything seen in mediæval rooms. The style was an adaptation of Italian largely influenced by the Dutch taste of the pattern-books. The influence of these books was not, however, as great as is sometimes supposed. There was never anything directly copied, and the English house is unmistakable.

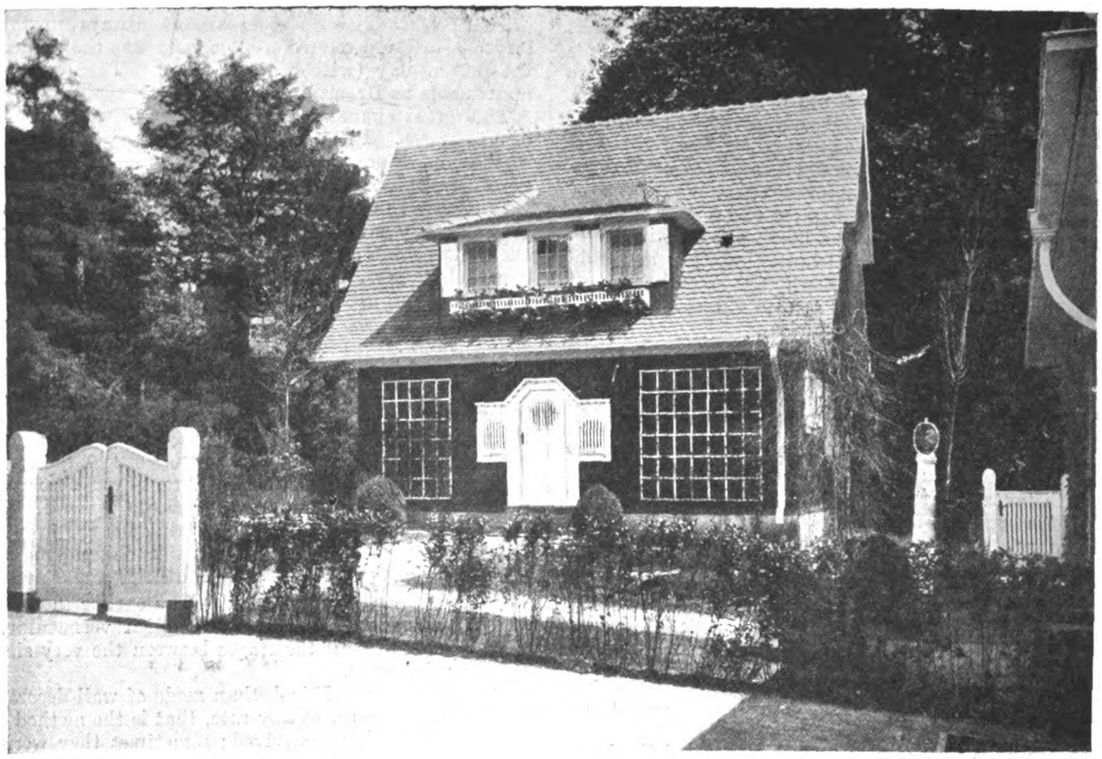
ETCHINGS BY FRANK BRANGWYN.

THE media of Mr. Frank Brangwyn, A.R.A., are many, for he has seriously worked at oil pictures, water-colours, tempera painting, decorative painting, etchings, and he has prepared designs for furniture, stained glass, &c. Two of these activities may be studied at the Fine Art Society's galleries in New Bond Street, where there is in progress an exhibition of water-colours and etchings by him. It is said that the artist is new to water-colour. If this is the case the forty-odd examples may be considered as experimental, which would account for much. Surer ground, however, lies in the forty-eight etchings.

It is easy to believe the statement made in a very recent biography of Mr. Brangwyn, that some art-lovers are less susceptible to his paintings than to his etchings, while others are interested in him above all as an interpreter of the life of to-day, and a pioneer in the movement of democratic art. The etchings are for the most part extremely fascinating as representing a strong personal point of view. No. 10, for instance, is entitled "The Church of Notre Dame, Eu;" it is a large picture, and practically deals with nothing but the building. Yet it is very far from architecturally satisfying, so far as being a record of detail is concerned. It shows the south-east end of the church with its dominating bulk emphasised by the fair in progress at its base. Mr. Brangwyn was more detailed in his mountebanks than in the window tracery. Nevertheless, the omissions appear rather to heighten the total effect of the church than to detract from it, for they seem the outcome of an admiration which would not stoop to dissect impressions. In No. 26, "St. Nicholas, Dixmuyden," the architectural detail of the south transept

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Moderne Bauformen.*

ARTISAN'S HOUSE IN RHENISH WESTPHALIA.—Herr Georg Metzendorf, Architect.

is shown much more faithfully, though without loss of power, so clever is the management of heavy shadow. The same largeness of handling is observed in all the examples. For instance, "Old Houses, Hammersmith" (No. 31), concerns itself with the work of demolition and not with any pleasing group of hoary houses such as still could be found to the delight of any ordinary etcher's eye.

Perhaps most characteristic of all are the subjects taken from Messina. A note in the catalogue says that they were the result of visits to Sicily, and notably to Messina, early in the present year, and shortly after the earthquake. Apparently the violent upheaval appealed forcibly to Mr. Brangwyn's mind, and he found a congenial task in representing the ruin and desolation in the streets. No. 21, "The Apse of the Duomo," might well be a scene in a besieged city, or even a suggestion of what may happen at the "Last Day." The lowering sky harmonises with the ruined transept, which has tumbled to the ground. The reason for such etchings as Nos. 18 and 19 is a little difficult to discover, for neither their subject nor their method of treatment offered scope.

Qualities of quite another sort are brought out in his figure subjects. The splendid decorative qualities which we expect from Mr. Brangwyn are here shown in full. Special attention may be drawn to the two lithographs "Platelayers," and "Men Unloading Boxes," as being suitable for ornamenting a wall without detracting from its architectural character.

ARBITRATION PROCEDURE.*
(Concluded from last week.)

Costs.

THE arbitrator must also deal in his award with the question as to the payment of the costs of the arbitration and the award. Much injustice may frequently be done to the parties by arbitrators not fully appreciating the result of the failure on their part to exercise their discretion upon this point, or exercising it without due consideration as to the results of their finding. Under Schedule I. (1) of the Arbitration Act an arbitrator has ample power and discretion with regard to the costs of the proceedings and award; he may even go so far as to act as taxing master, and determine the amount thereof, unless the submission provides otherwise.

If the submission leaves to the arbitrator the question of how the costs of the arbitration and the award are to be paid, and the arbitrator fails to deal with them in his award, the Court will refer the matter back to him for him to deal with; on the other hand, if the submission is entirely silent as to this, then, if the arbitrator fails to deal with the question of costs in his award, or with the question as to who is to pay his own fees, each party will in ordinary cases have to bear their own costs, and the party taking up the award will have to bear the arbitrator's fees, without being able to claim against his opponent in respect of any part of them. If the submission provides that the costs shall follow the event, then the party who succeeds in the arbitration will, without any order by the arbitrator, be entitled to recover from his opponent such costs as may be allowed him on taxation.

In the great majority of cases an arbitrator cannot possibly do better than give the party in whose favour he awards payment of any sum of money (not merely nominal) the whole costs of the arbitration and award, unless he finds from the correspondence that there was an offer to pay a sum equal to the amount he intends to award before the commencement of the arbitration. In the Courts this is nearly always the way costs are dealt with in an action on a money claim, and an arbitrator should be safe in concluding that what is fair in an action before a court of law is equally fair in an arbitration before him. The practice in the Courts depends to a great extent upon the amount recovered, and questions arise as to whether the successful party is entitled to High Court or County Court scale of costs; but where the parties have chosen their own tribunal I do not think the amount is really so much a matter for consideration, unless, of course, only a nominal amount is awarded, or the claimant has delivered such an inflated claim and has lost on so many issues that it is manifest that he has put his opponents to unnecessary costs and expenses; in which case, if the result of the award is that the claimant is only awarded a very small portion of his claim, then the arbitrator must act judicially, and either make each party pay half the costs and half his fees, or even in certain cases I can conceive that

* A lecture delivered by Mr. George Philips, J.P., of the Inner Temple, barrister-at-law, before a meeting of the Auctioneers' Institute at Russell Square, London, on November 9, Sir Robert Buckell, J.P., president, in the chair.

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Moderne Bauformen.*

ARTISAN'S HOUSE AT ESSEN.—Herr GEORGE METZENDORF, Architect.

he would order the claimant to pay a share of the defendant's costs in order to prevent a manifest injustice being committed; and in such a case either party would, I believe, be entitled to ask for the opinion of the Court on the point as on a point of law. In all Courts, if the defendant admits something is due, but not the whole amount claimed, and wishes to protect himself against the consequence of an adverse finding, he will, if he is wise, pay into Court such an amount as he is advised will protect him from the danger of being ordered to pay costs. But in an arbitration there is no Court for money to be paid into, and the only thing for the party wishing to make the payment to do is to make an offer in writing, and such a proceeding on the part of either party should be allowed by an arbitrator to act as an alternative to actually paying money into Court. Where a litigant claims an admitted debt, and the opponent claims a right to retain the whole sum by way of set-off, then, if the award gives the defendant, say, one-half of the set-off, it is not equitable or just to order the claimant to pay any portion of his opponent's costs, or to deprive him of payment of his own costs by the opponent; for it must be remembered that the only object that the claimant had in going to arbitration was to recover a sum admittedly due to him, and that the only way in which he could recover it was by referring the matters in dispute to arbitration, in accordance with the agreement, otherwise, by thus depriving him of a portion of his costs, or, in the event of nothing being awarded to the claimant, to deprive the opponent of his costs, the arbitrator would deny to one of them the relief which in common justice and fairness he is entitled to demand.

If this is not recognised by the arbitrator the claimant may get an award in his favour, but if he does not get his costs, or if they are given against him because his opponent has succeeded to a certain extent, the claimant may, in having to pay in his own costs and the costs of the other side and arbitrator's fees, actually pay more than the amount due to him, and this owing not to his own but to his opponent's fault in not settling an admitted debt, but by retaining the whole amount, and thus forcing on an arbitration, and consequently a very great injustice will be inflicted upon the claimant. If the claims are capable of being separated into two or more issues, or if the defendant counterclaims, and on any of these claims or counterclaims either party fails *in toto*, there is no reason why the arbitrator should not in his award direct the party failing to substantiate any such issue to pay his opponent's costs in respect of such issue. However, an arbitrator will as a general rule be much wiser to steer clear of making any special award with regard to portions of the costs, as distinguished from the costs of the whole matter, and should leave it to the taxing master to do justice between the parties. In some cases both parties are asked by the arbitrator what they think will be a fair amount to fix in the award for costs, and then the arbitrator splits the difference, or arrives at a figure between their two figures, and settles upon that as a definite sum; but this is a very unsatisfactory method as a rule, for it is generally quite impossible for the parties to tell what is a proper sum to be inserted. It will very likely be within the arbitrator's knowledge or experience that in getting up many cases, and especially those usually sent to arbitration, the costs are often bound to amount to more than the sum in dispute. This is often quite inevitable, and is not attributable to any improper conduct on the part of either of the parties.

When the award is completed the arbitrator should sign and publish it by giving notice to both parties that it is ready to be taken up, and thereupon his office is executed. The award must, of course, not be altered or interfered with in any way, as the arbitrator's powers are at an end, excepting in so far as it may be necessary for him, under the power conferred by Section 7(*c*) of the Arbitration Act, "to correct any clerical mistake or error arising from accidental slip or omission." Although the award requires to be stamped with a duty of ten shillings before it can be enforced, it is not the arbitrator's duty to see to this, but it should be left to the party having the right to enforce it.

Enforcing Award.

When the award has once been regularly made and published, provided it is upon a submission made in writing, it can be enforced as an order of Court or judgment by originating summons. The summons should be headed, "In a matter of an arbitration between A. and B.; and in the matter of the Arbitration Act, 1889." It should ask for "Leave to enforce the award of the arbitrator (naming him), dated in the above arbitration, in the same manner as a judgment or order to the same effect," and should be supported by an affidavit verifying the submission and the original award. On the hearing of this summons an order will be made, as of course, unless an affidavit in opposition is filed showing that the award should be remitted as being

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irregular in some respects, under Section 10 of the Arbitration Act, or that there was misconduct on the part of the arbitrator.

Remitting Award.

The Court has power to remit the award of an arbitrator or umpire to him for reconsideration or to set it aside altogether.

The method of procedure is by motion to the Court, either the Divisional Court or to a judge in the Chancery Division, and I very strongly recommend the latter; it may also be made by originating summons, but that is a method I cannot advocate. The notice of motion to set aside must be given before the last day of the sittings next after the award has been made and published. In remitting, however, no time is prescribed, and therefore it must be made within what, under the special circumstances of the case, is a reasonable time. The grounds upon which it is sought to remit or set aside must be set out in the notice in general terms.

The grounds for remitting an award back are:—

1. That there is some defect patent on the face of the award or that the award is uncertain or ambiguous.

2. That the arbitrator has admittedly made some mistake, has exceeded his powers, and misunderstood the submission, and that, therefore, the award is bad as to part.

3. That material evidence has been discovered which could not with reasonable diligence have been discovered by the party tendering it prior to the publication of the award.

4. That the award is inconsistent or bad in law.

With regard to an award being good in part and bad in part the rule is that if the parts are separable, then the good part of the award will be enforced and the bad part rejected. When, however, the bad part of the award is inseparable from the remainder, the award will be altogether bad.

Setting Aside an Award.

The parties having selected their own tribunal, it is only fair that they should be bound by it; and, therefore, when a valid award is made by an arbitrator it is binding upon the parties, and there is no appeal.

If the arbitrator states his award in the form of a special case, either on a question of fact or a question of law, the matter can be brought before the Courts, as we have seen; and questions of law can be submitted to the Court during an arbitration on the request of the parties, or at the arbitrator's option, or by order of the Court.

The only other method of appealing is to do so by an application to the Court to set aside or remit an award on one or other of the grounds we are now considering; and unless the arbitration has been conducted, and the award been drawn up, very carefully it is wonderful how very frequent it is that an award can be upset. There is seldom any difficulty, whereas it should be practically impossible. The reason why it is so easy is because arbitrators do not study sufficiently what the essentials are to make an award valid, and too often do not understand the reasons which influence the Court in setting aside an award.

This is a most interesting question of arbitration procedure, and one I may possibly have an opportunity at some future date of discussing with you if the matter interests your Institute. This evening I can only give you a series of instances as examples where the Court will remit an award or probably set it aside altogether, and, if it is set aside through the arbitrator's carelessness or inexperience, I fail to see what defence he would have to an action to refund the fees he has been paid on the ground that the consideration in respect of which he was paid has failed.

Under Section 11 of the Act, where an arbitrator or umpire has misconducted himself, or an arbitration or award has been improperly procured, the Court may remove him or set aside his award. What would amount to misconduct within the meaning of this section must, of course, be a question of fact in each case, but the following are instances of that which the Court has viewed as misconduct. Where an arbitrator—

(1) Accepts hospitality from one of the parties, the invitation being given for the purpose of inducing the arbitrator to act unfairly.

(2) Is corrupt or partial.

(3) Is secretly interested in the subject-matter; and an award was set aside on discovery that the plaintiff had assigned to his arbitrator for value his claim under a fire policy, the subject of dispute.

(4) Refuses to postpone the meeting to give one of the parties time to bring counsel before him where the other side appears by counsel.

(5) Hears one side in the absence of the other without giving the other the opportunity of attending.

(6) Deliberately decides contrary to law.

(7) Refuses to state a case for the opinion of the Court where the proper application has been made, and refuses to delay his award till an application can be made to the Court to compel him to state a case during the course of the proceedings, and publishes his award.

(8) Publishes the award before either party has had an opportunity of submitting his whole case.

(9) Fails to decide all matters submitted to him for decision.

(10) Decides questions which were not submitted to him.

(11) If the award is inconsistent, uncertain, or is on the face of it erroneous in point of law.

(12) Examines a witness or party privately in the absence of his opponent.

(13) If the arbitrator proceeds in the absence of one party without giving clear notice of such his intention.

Another ground for setting aside an award besides corruption, mistake, or misconduct on the part of the arbitrator is where either party can be proved to have been guilty of fraudulent concealment of matters which he ought to have disclosed, or if he wilfully misled or deceived the arbitrator. Also, if new evidence is discovered after the award is published which the party discovering could not reasonably have been expected to discover earlier, and which takes him by surprise, this also may be made a ground of application. The time within which application for setting aside an award must be made is "before the last day of the sittings next after such award has been made and published to the parties." The Court may, however, "enlarge or abridge the time for doing any act or taking any proceeding," and this has been held to apply to an application to set aside an award. An application to set aside an award is made by motion to the Court, and the notice of motion must state the ground upon which the application is made.

I have been obliged to treat this subject broadly and omit much detail which would have added very materially to its usefulness for reference when printed, as I am given to understand it will be; but, the time being limited, I have had no alternative. Each of the heads in the synopsis is sufficient for separate consideration; but I shall have achieved my object if these somewhat disjointed ideas give assistance to any of you, and I should have more than achieved my object if by this introductory address I could raise "arbitration procedure" so that it becomes more uniform in practice.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Walton-on-Hill Church.

Sir,—The gentleman who read the Paper on this and Headley churches, reported in the current *Architect*, is I am sure mistaken in saying Walton's is modern. I was there only two or three weeks ago, and took photos of it and of the canopied recess on the north wall at the east end (outside), and though the church has been considerably modernised, especially by the erection of the pretentious west tower that replaces the typical Surrey villages' bell-turret, the sacred edifice is not a modern one.

The same can, unfortunately, be said of Stoke d'Abernon Church and a few others in Surrey. What Headley's former church was like I cannot as yet say, as I am wading through thirty thick folio volumes of a work on the County that are full of old drawings and water-colours and prints of the greatest possible interest, in addition to the very full text.

How many antiquaries and archæologists, even in Surrey, know of this work?—Yours faithfully,

John A. Randolph.

Nov. 26, 1910.

Mr. J. A. O. Allan, architect, Aberdeen, has been appointed by the Governors of Robert Gordon's Technical College, Aberdeen, as architect for the new Technical College buildings.

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The Architect.

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FORTHCOMING EVENTS.

Monday, December 12.

Architectural Association : Mr. G. Leonard Elkington on "That Foreign Travel and Study Retard the Development of a National Style."

Tuesday, December 13.

Guild of Architects' Assistants : Mr. H. L. Pridmore, Q.S.A., on "The Relationship of the Quantity Surveyor to the Architect."

Wednesday, December 14.

Royal Society of Arts : Mr. Reginald A. Smith, B.A., on "A New View of Roman London."

Manchester Society of Architects : Professor S. H. Capper on "Westminster Cathedral."

Northern Architectural Association : Mr. W. Davidson on "East Anglian Rood Screens and their Paintings."

Thursday, December 15.

University College, London : Mr. J. A. Gotch's course on English Domestic Work; concluding lecture (8) on "Eighteenth Century Homes."

Society of Architects : Mr. G. A. T. Middleton on "A Great London Improvement."

Royal Society of Arts : Mr. R. Fellowes Chisholm on "The Taj Mahal and its Relation to Indian Architecture."

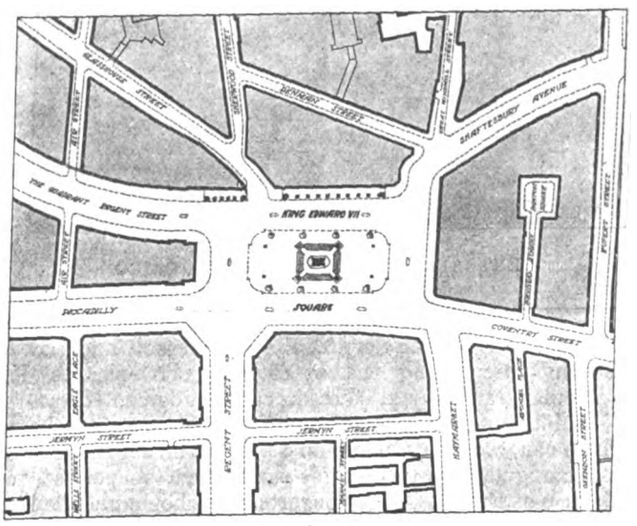
PICCADILLY CIRCUS.

THE character of Piccadilly Circus as a circus has gone completely and for ever, and what we have at present is but one more example of the lugger-mugger style of town-planning, of which there are in London so many examples, resulting from the grafting of "improvements" on older arrangements of which the suitability has departed. The underlying fault of our so-called "improvements" is usually that they are not sufficiently drastic, but sacrifice all sense of architectural fitness, and too often practical considerations of traffic facility and recoupment, to an unwise restriction of capital expenditure.

Examples of this error are strikingly exemplified in Kingsway, Rosebery Avenue, and other recent improvements. Fine wide roads have been made with an insufficient purchase of adjoining land to afford proper opportunities for recoupment, with the result that miserable little plots are left abutting on the new thoroughfares that are of no use to anyone except the owners of adjoining property and utterly unattractive to speculators, except for the builders of one-storey lock-up shops, and these often of so small a depth as to be valueless for the great bulk of tradesmen. Worse still, from the ratepayers' point of view, has been the maintenance of existing frontage lines in the lay-out of new streets without the purchase of the abutting property. Thus the owners of low-class property in narrow back streets have been suddenly transformed into the possessors of valuable frontages on important new main thoroughfares at the expense of the general body of ratepayers, and in default of an acceptance of the principle of betterment. In this way, whilst the capital expenditure has been kept down, there has been a serious loss of recoupment, which has made the improvement far more costly to the public than it need have been with a broader-minded and more courageous scheme.

In the treatment of Piccadilly Circus there is another instance of unwise parsimony in dealing with a problem of civic planning. One quarter of the original circus has been wiped out, and the remainder left thrown open to an amorphous space of considerable size. Thus the circus has gone, and we have instead a place devoid of all architectural character, in spite of the futile attempt to indicate lines of traffic by the inclusion of the triangular island and the fountain which is not allowed to play.

As a rectification of this muddled and half-hearted "improvement" the plan prepared by Mr. JOHN MURRAY, and submitted to the Lord Mayor's KING EDWARD Memorial Committee, is well worthy of consideration as a desirable public improvement, even though it has been eliminated from the list of suggestions made for the



PLAN AS PROPOSED

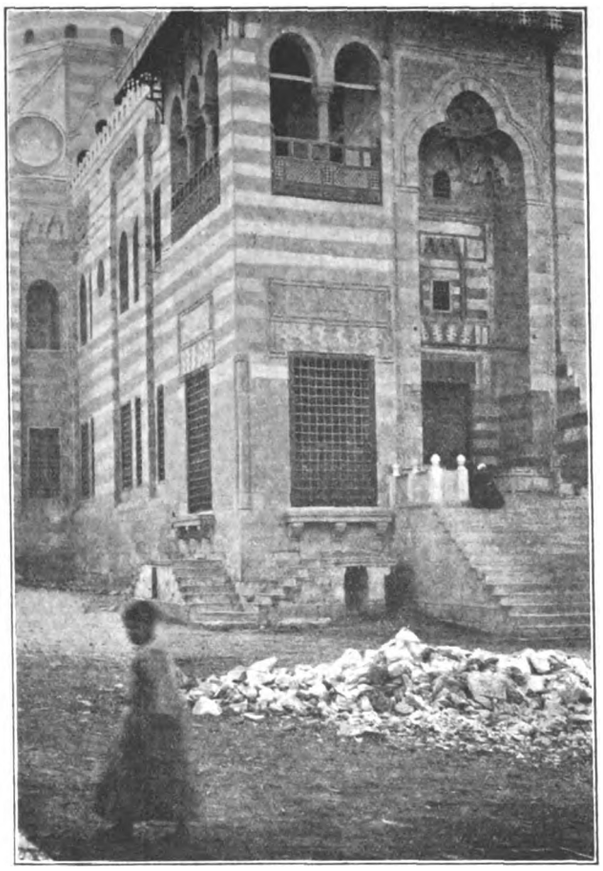
Memorial in the weeding-out process to which the Lord Mayor's Committee has directed its attention.

Mr. MURRAY'S scheme, as may be gathered from the plan, takes advantage of the improvements that are in course of being adopted for the Crown property in Regent Street and Piccadilly and, abandoning the remnants of Piccadilly Circus, proposes a grand square or place, 400 feet by 240 feet, by cutting off the Café Monico corner and clearing away the Pavilion Music-hall triangle, thus providing a fine site for the sculptured memorial of KING EDWARD. From this point of view the scheme is unquestionably admirable, but we must accept the decision of the Lord Mayor's Committee that other suggestions are more suitable.

We have now, therefore, to consider whether Mr. MURRAY'S proposal is desirable merely as a civic improvement. In his letter to the Lord Mayor offering his plan as a suggestion for the KING EDWARD Memorial, the author puts forward reasons for its adoption as a public improvement as well as a suitable memorial. The latter having been found insufficient, we need only refer to the former.

Mr. MURRAY claims that his scheme would be practical and æsthetic, and would meet an important and pressing need; that part of the scheme, on the west, is already provided for, and the only obstacles to be surmounted are the Café Monico corner and the Pavilion block; that, in place of the present congestion, convenient and direct access would be afforded to and from the seven and important radiatory streets—viz. Piccadilly, Regent Street, Glasshouse Street, Shaftesbury Avenue, Coventry Street

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ENTRANCE PORCH TO MOSQUE, CAIRO.

through to Leicester Square, the Haymarket, and Lower Regent Street—and the space and conveniences for vehicular traffic would be enlarged and augmented.

Of the æsthetic qualities of Mr. MURRAY'S scheme there can, we think, be no question. The substitution of a rectangular open space for the present shapeless confluence of streets at once converts an inchoate muddle into an organic unity, and with adequate buildings on the north and east to harmonise, if not to conform, with those on the west, would give London an open place that would be a proper source of pride as an example of civic design.

We now come to the consideration of the practical aspect of Mr. MURRAY'S scheme. In this there are two points—the improvement, if any, of the traffic facilities, and the amount of recoupment that may be anticipated in mitigation of ultimate cost. The primary cause of the undoubted congestion that at present exists is that Piccadilly is fed by streams of traffic from four of the seven principal streets that debouch into the Circus—Lower Regent Street, Haymarket, Coventry Street, and Shaftesbury Avenue, of which Coventry Street is as wide as Piccadilly at the Circus end, and the other three are wider. A further contribution to the congestion comes from the traffic southward from Regent Street Quadrant and Shaftesbury Avenue, the present natural outlet of which is Lower Regent Street.

In Mr. MURRAY'S plan Piccadilly is to be widened at its eastern end, and so will be better fitted to receive the joint streams of traffic that flow into it; but as this has already been arranged independent of the proposed square, it can scarcely be fairly claimed as a merit of Mr. MURRAY'S scheme. The proposed new square would, however, certainly tend to divert the traffic between Regent Street Quadrant, Shaftesbury Avenue, and the south from the present point of greatest congestion to the east side, and so to the Haymarket. The traffic between Coventry Street and Regent Street Quadrant would also be diverted along the north side of the square, and so deflected from the congestion point. Generally the greater space and increased option of route would assist the prevention of congestion of the cross-traffic between the principal streets. Hence from the practical point of traffic facility we may certainly come to the conclusion that Mr. MURRAY'S plan would be a decided improvement.

Next as to the financial practicability of the scheme. There is valuable property to be acquired and thrown into the improvement, first at the Café Monico corner, and second in the Pavilion block. As regards the former, there is a very slight loss of frontage, and in recoupment the improved character might compensate for this, and we should only have the loss of area to pay for. Here the setting back of the frontage increases the value of the back land, so that the comparative value of the area thrown into the square is diminished.

The Pavilion block would be costly to acquire, but this cost might be diminished by including a sufficient area of the old property on the east side of Great Windmill Street to allow of reinstatement, and this could be done without incurring the loss of current profits of the Pavilion. Thus, although we do not pretend to say that the scheme would not cost money, it is, in our opinion, a perfectly practicable one, and the advantages to the public would be worth the cost.

NOTES AND COMMENTS.

THE published sketch of Mr. G. GILBERT SCOTT'S amended design for Liverpool Cathedral shows a conception of remarkable originality, boldness, and power, and we are glad to know that it has been approved by the Executive Committee. The substitution of a great central tower for the twin towers of the original design is a distinct gain in composition, more particularly from the elevated position of the cathedral on St. James's Mount. In itself the tower shows originality of thought and a fine expression of power, and is admirably grouped with the qua-transeptal projecting masses from the lines of the nave.

THE Court of Common Council has received a deputation from the Royal Institute of British Architects urging the necessity of the Corporation's obtaining architectural advice upon the whole proposal for the new St. Paul's bridge, and the memorial presented has been referred to the Bridge House Estates Committee for consideration and report. The President of the Royal Institute was able to combat a hidden fear which has apparently obsessed the minds of the Committee that the Institute desired to have the plans settled by them, or that they should appoint the architect; that, in plain language, the Institute want to make a job instead of being actuated by a public-spirited desire that the new bridge shall be a credit to London and not another laughing-stock for the artists and art-lovers of Europe and America. How little the members of the Corporation really know of the art of architecture is shown by a suggestion that appears to have been made, that Blackfriars Bridge and the Tower Bridge are worthy of admiration for their design, instead of being, as they are, engineer-constructed skeletons dressed up in architectural clothes that do not fit. It has yet to be understood by the ordinary citizen that architecture is a great deal more than the mere outward adornment of an utilitarian structure.

PROFESSOR BALDWIN BROWN appeals for assistance to enable the Cockburn Association of Edinburgh to raise 1,000*l.* for the purpose of securing in perpetuity the fine old Edinburgh mansion of the sixteenth and seventeenth century which adjoins the well-known "JOHN KNOX'S House," and was once the town house of the MOWBRAYS of Barnbougle, on the Forth. There should be no difficulty in raising the sum required among Scotsmen who desire to see preserved the characteristic buildings of old Edinburgh.

AT the anniversary dinner of the Royal Society Lord ROBSON, in proposing the toast of the evening, referred to the part played by science in advancing the cause of social reform, and said that perhaps the most hopeful

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attack on overcrowding is being unconsciously made by those men of science who have lately done so much to improve the transmission of electric power. They are on the way to make it possible and profitable for factories to establish themselves away from cities and coalpits, and yet have the exact amount of power they want each day for their machinery sent down to them every morning by wire at a trivial cost. Some day manufacturers will begin to go back to the land, and we shall regard engine-building or soap-boiling as rural occupations. He also urged men of science to give attention to the problem of the sanitary conquest of the air of England as a sequel to the conquest of the sanitary conditions of the tropics, and in particular to aim at the purification of the air of our cities now smoke-laden and devitalised. In this country we have scarcely begun to dream of the application of water power to manufacturing industries by transmission of electric current from nature's power-houses, whereas in the United States and Canada it is one of the prominent topics of the day. True we have no falls here as big as Niagara, but there is a considerable amount of power waiting for employment, and all capable of assisting in smoke-abatement.

THE Christmas number of *Country Life* is not only remarkable for the amount of its illustrations and letterpress, but interesting for the departure from the style of printing usually adopted. Instead of black ink on a glazed surface we have dark-brown and dark-green on a matte, or unglazed paper, used for some of the pages. The result as regards the illustrations is a softening effect and a reduction of the sharpness and brilliancy of the more usual style, which, however desirable in certain cases, has undoubtedly more artificiality than is consistent with artistic presentiment. The all-recording eye of the photographic lens is deprived of some of its unnatural character, and although the architectural student who has found in *Country Life* illustrations of buildings a wonderful indication of detail may feel a loss, there is an undoubted gain in æsthetic truth.

To architects the *Country Life* Christmas number is of more than ordinary interest, as it contains as an example of the Lesser Country Houses of To-day a description and illustrations of "Littleshaw," Woldingham, Surrey, the home of Mr. LEONARD STOKES, the new President of the R.I.B.A. We will say no more of the design than that it is characteristic and charming. The larger country home illustrated in this issue is "Maryland," in the Alpes-Maritimes, the residence of Mrs. ARTHUR WILSON. This was designed by Mr. H. A. PETO, formerly a partner of Mr. ERNEST GEORGE, and so intimately has he woven together house and garden that it is impossible to consider either except as a part of the other. "The Architecture of the Small House," by Mr. JOHN W. SIMPSON, is a review of Mr. LAURENCE WEAVER'S "Small Country Houses of To-day."

SOME of the difficulties of town-planning that face municipal authorities are illustrated by a Memorandum, prepared by the Garden Cities and Town-planning Association (Edinburgh and East of Scotland Branch) and presented to the Edinburgh Town Council, on the laying-out of the ground belonging to the Corporation adjoining the new markets at Gorgie. While advocating as desirable the following points:—(1) The number of houses per acre should be limited to a number necessary for health and amenity. Ten to twelve houses per acre is the number suggested by competent authorities on town-planning. (2) There should be sufficient provision for open spaces, including playgrounds for children. (3) The streets should be so arranged as to admit of all the houses getting a maximum of sunshine. (4) The streets should be divided into traffic and non-traffic streets, only the former having roadways of regulation width and construction, the latter, on which there will be little or no traffic, being of lighter construction. This arrangement will greatly lessen the cost of development. (5) While some tenements may be necessary, arrangements should be made for a certain number of two-storey houses—it is frankly admitted that the financial difficulty is a serious one. It is a matter of common knowledge that the price the Corporation has paid for the ground which they now propose to feu, coupled with the fact that a number of years will have to elapse before it can be fully taken up, makes it almost impossible for the Council to give off the ground at a rate at which it can be developed in a thoroughly satisfactory manner without involving a certain amount of loss. It is, however, urged by the Association that now that the Town Planning Act is law, the development of this portion of ground belonging to the Town Council will in the future be almost certainly taken as the standard under any town-planning scheme which the Council may prepare or adopt. If the town proceeds to develop its own property on lines short of the best, it will be impossible for it later to insist—when it comes to prepare schemes embracing the property of other proprietors—on provisions more stringent than those it has itself adopted in regard to its own property. The development of this area belonging to the town will be taken as the high-water mark of what can be enforced. With this fact in view, the question of how this particular area is to be laid out becomes a matter of vital importance to the whole community.

THE Education Committee of the South Shields Town Council has wisely determined that the preparation of plans for the schools it needs should not be put into the hands of the borough engineer, but entrusted to an independent architect. In the course of the discussion, which turned largely on the financial aspect, it was made clear that the official carrying out of the work would mean an increase of staff costing 150*l.* or 200*l.* a year for two or three years, and that an architect's fees would not amount to more than 400*l.*; but an even more important consideration was advanced by one of the aldermen, who pointed out that while the borough surveyor's work in the town had given the greatest satisfaction, it could not be expected that he could be thoroughly up-to-date on such a technical matter as the erection of new schools. This is the essence of the whole matter. The practice of loading municipal engineers with architectural work means the employment of young assistant architects or draughtsmen in a subordinate and irresponsible capacity instead of an expert, who, even if his fees are more than the salary of the hireling, saves their amount over and over again to the ratepayers. Nine times out of ten the actual expenditure on salaries and expenses of the borough engineer's assistants is more than the fees of an independent architect.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL business and ordinary general meeting of the Royal Institute was held at Conduit Street on December 5, Mr. Leonard Stokes, President, in the chair. Previous to calling on Professor Reginald Blomfield, A.R.A., to read his paper, the President announced the presentation by Mr. Ernest George, A.R.A., of two of his water-colour drawings. A vote of thanks to him was moved by Mr. L. Stokes, and adopted, and Mr. E. George briefly replied.

Professor BLOMFIELD then read his paper on

Pierre Lescot and Jean Goujon.

Few men have done so little for their reputation as Pierre Lescot. Historians have placed him in a niche of his own as the finest French designer of the sixteenth century. Yet, in fact, very little is known about Lescot, and what evidence there is points, in my opinion, to a different conclusion.

Pierre Lescot was born at Paris about 1510, and came of a legal family of some distinction. From a poetical epistle addressed to him by Ronsard we learn that in his early years Lescot showed his artistic instinct by drawing at school when he ought to have been minding his books, and that at the age of twenty he added to his skill in painting the study of mathematics and architecture. There is no evidence that he went to Italy, nor did he produce any works on architecture, as did most of the architects of the time. He first appears on the scene in charge of the jubé or rood loft

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of St. Germain l'Auxerrois, which was being built between 1540 and 1544. In 1544, when the rood loft must have been nearly completed, a certain Pierre St. Quentin, master stone-cutter, appears in charge under the Sieur de Clagny (Pierre Lescot), and in the same year Jean Goujon, "carver of images," receives payment for a "Notre Dame de Pitié," the four Evangelists in half relief, six heads of cherubs, and other details for the work. The inference to be drawn from these entries is that in 1544 a fresh contractor came in, and Lescot was placed in general charge. It will be found that in every work in which Lescot was engaged he never failed to associate with himself Jean Goujon. Lescot and Goujon were also associated in the famous "Fontaine des Innocents," which was built in 1550 at an angle formed by two streets, the Rue aux Fers and the Rue St. Denis, next the Church of the Innocents. The fountain abutted against the church, and was built as an open loggia with two arches at the sides and one at the end.

Meanwhile, Lescot had been called in for the rebuilding of the Louvre, which in the reign of Francis I. was still an awkward mediæval castle. The patent refers to Lescot as having made the designs and as having "bonne expérience en fait d'architecture et grande diligence," and as having been fully acquainted by the King with his intentions in regard to the new buildings. The patent dwells particularly on this latter point of Lescot's intimate knowledge of the King's wishes; for Francis, up to the very end, meant to be his own architect, and all he wanted was some supple and intelligent servant to put his ideas into shape and to act as building policeman.

Lescot's design is believed to have provided for the entire rebuilding of the rectangular court of the mediæval Louvre. The work was begun on the west side, facing towards the Tuileries, and was carried towards the river southwards from the present entrance. The staircase near the entrance with stone coffered vault, now the approach to the picture galleries, is probably all that remains of the work done in the reign of Francis I. Under Henry II. the part to the south of this staircase was built, containing the famous Salle des Caryatides and the Tribunal on the ground floor, up to and including the pavilions at the south-west angle. Considerable sums were spent on the building in 1568. Lescot received his salary of 1,200 livres for that year, but after that no further mention of him occurs in the "Comptes," and nothing further is known of his work at the Louvre between that date and his death ten years later. His work was probably limited to the superintendence of the south wing. It almost looks as if in his latter days Lescot had lost the source of his inspiration, and was not prepared or invited to undertake further design.

The Hôtel Carnavalet has been attributed to him, but probably the only ground for this suggestion is that Jean Goujon undoubtedly executed some of the sculpture here. The Louvre and the jubé of St. Germain are the only works with which Lescot is known, on authentic evidence, to have been connected. His connection with the jubé was of the slightest. For the Louvre designs were undoubtedly prepared, which were officially treated as by Lescot, and which continued in his possession till his death.

Two questions present themselves in regard to these designs:—First, what was their architectural value? Secondly, who made them?

In regard to the designs, the plan was not particularly original. It was to follow the lines of the old Louvre in general outline, and the wings were to be in single thickness; that is, there was no attempt to provide independent access to the various rooms. The merit of the interior consisted almost entirely in its consummate detail. On the exterior the design was concentrated on the façade to the Court. This was made before 1550, and was technically in advance of any neo-Classic yet done in France in the refinement and accomplishment of its detail. There is a distinct reminiscence of the ground-floor arcades of Ancy le Franc, which were probably designed by Serlio, and the story that Serlio prepared a design for the Louvre which was set aside in favour of Lescot's has never been proved or disproved. Did Lescot avail himself of this rejected design? And how was it possible for a man who, so far as is known, had not been in Italy, and had certainly not studied architecture from his youth up, as De l'Orme had done, to arrive *per saltum* at this perfection of detail? For, whatever one may think of the design as a whole, there is no denying the technical perfection of its detail. On the other hand, considered as an architectural composition the façade is weak and monotonous. It is evident that the designer was more intent on sculpture than architecture, for there is no attempt to keep the two in scale and relation to each other. Goujon having fled to Italy the master-hand that might have kept the scale and balance of the design was no longer there, and Lescot, left to himself, was powerless to control the exuberance of inferior men. Lescot's design for the Louvre is very much what one would expect of an amateur whose ideas are translated into practical shape by a skilful sculptor.

Lescot never undertook a building unless Goujon was associated with him; Goujon disappeared from the scene after 1562, and from that date forward, Lescot is not credited with any designs. The inference seems very strong that Goujon was the designer of Lescot's buildings, and that Lescot was the influential and accomplished amateur at Court, who got the work and saw it through, and steadily drew his 1,200 livres a year for the last eight-and-twenty years of his life. There is no direct evidence for this conclusion.

Goujon, whose fame now rests entirely on his sculpture, was, as a matter of fact, an architect of admitted reputation and attainments. Nothing is known of his early training. He is first heard of at Rouen, where he was employed at St. Maclou and in the cathedral (1540-2).

In 1544 Goujon was in Paris working on the rood screen of St. Germain, as already described, and appears in the Comptes as "tailleur d'ymages." It must have been about this time that he, or Ponce, carved the splendid panels of lions on either side of the entrance to the Hôtel Carnavalet, and the figure with the cornucopia on the keystone.

Goujon must also have been employed in the Château of Ecouen before 1547. In that year a translation of Vitruvius by Jean Martin was published at Paris with illustrations, and an introduction by Goujon. Martin, in his dedication to Henry II., described Goujon as "naguère architecte à Monseigneur le Connétable, et maintenant l'un des vôtres." Goujon was evidently regarded by his contemporaries as not less distinguished in architecture than he was in sculpture.

He first appears in the Comptes of the Louvre in 1555-6 as "maistre Jean Goujon, sculpteur en pierres pour le Roy," when he receives 560 livres for works of sculpture. In September 1562 he receives payment of 716 livres for works that he has done and will do at the Louvre. After that he disappears from the accounts and from France.

An entry in the registers of the Inquisition at Modena proves that Goujon was at Bologna in 1563, and that he died there before 1568. What was the cause of his leaving Paris has not yet been discovered. Goujon, who was of the Reformed religion, had already got into trouble at Etampes in 1555, when he was arrested but let out on bail.

His flight to Italy marks the beginning of that downward course from which the arts of France did not recover for at least fifty years. Though skilful sculptors and ornamentalists were left, there was no one with his inimitable sense of style, no one to take up his untiring quest of beauty.

Goujon occupies a unique position in French art. He stood alone as the man of ideas, and to him more than to any Frenchman of the sixteenth century belongs the credit of having stemmed the tide of ugly reaction that had all but stifled the innate genius of the French for sculpture. For the great art of the Middle Ages had almost gone under in the invasions of the Netherlands craftsmen. The recovery of that lost spirit was Goujon's great attainment. He taught his countrymen that the function of sculpture is not didactic or literary or blood-curdling or disgusting, but solely the search for and expression of beauty. He taught them, too, that sculpture and architecture must go hand in hand, architecture giving the right environment to sculpture, sculpture giving full utterance to that which can only be hinted at by architecture.

Mr. E. A. RICKARDS opened the subsequent discussion by remarking that he considered Professor Blomfield deserved their thanks in a very unusual degree for his interesting paper. It appeared to him that biographical essays of the character of the one just read and like those contributed to the Institute in the past by Professor Pite were of very great assistance to architects who wanted to make their work sublime. He had come to the meeting hoping to hear of an ideal partnership between Pierre Lescot and Jean Goujon. But from what Professor Blomfield had said this did not appear to have been the case. There were, however, many contentious points which might be raised out of the paper.

Mr. F. W. POMEROY said it was gratifying to him as a sculptor to learn that an architect was willing to accord full credit to a sculptor. Goujon was admired by sculptors for presenting their art in its noblest form, for breaking away from the shortcomings of the past, and for the adaptability of his designs to the sculptor's medium. The more archi-

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tects knew of sculpture the better it would be for them and the better for the art of sculpture. It was also true that the earlier young sculptors got their training, and the more they knew of architecture the better.

Mr. H. H. STATHAM expressed surprise that Pierre Lescot should have been knocked on the head so much. One had always heard of him as an excellent architect. Professor Blomfield's argument rendered it probable that he was dependent on Jean Goujon. There was something peculiar about the latter's style of sculpture. It always seemed to him to be inspired by Greek feeling translated into French. In that respect Goujon stood quite alone. His caryatide figures must have had a striking resemblance to the caryatides of the Erechtheum. It was the same idea and they had the same general composition, but they were imbued with a totally new feeling. It did not seem in the least possible that Goujon ever went to Greece, though he may have seen drawings of Greek work. It was certainly very remarkable the way in which his figures recalled the Erechtheum caryatides. Goujon really began work as an architect,, and in consequence he knew well how to accommodate sculpture to architectural bounds. The lesson to be learnt was that if sculpture is to be combined with architecture it is well for the sculptor to have learnt something of architecture, so that his work shall not appear extraneous.

Mr. W. H. WARD mentioned that in 1542 Goujon was had up for attending the sermon of a Lutheran pastor, and as a punishment he was sent to attend the execution of this pastor in his church. There was no doubt that Goujon was an architect. Professor Blomfield had hardly seemed to give full credit to Lescot, for he appeared to minimise the fact that Lescot was in charge of the works at the Louvre before Goujon appeared. Furthermore, Goujon himself speaks of Lescot as one of the few persons in France who had knowledge of Vitruvian teaching. Evidently he considered him learned in the laws of Vitruvius. Lescot may very well have made a journey to Italy. Additional evidence on the point of his ability is offered in the fact that in the very last year of his life Lescot was called upon to give evidence before the commission charged with erecting the Pont Neuf, Paris, along with other practical experts. There may really have been that delightful partnership between the two artists Jean Goujon and Pierre Lescot. It was well to remember that the court of the Louvre, as designed by Lescot, was much smaller than now, for fifty years after his death it was decided to enlarge it four times.

Mr. F. DERWENT WOOD considered that Goujon must have seen some very early Renaissance panels, for he adopts all their mannerisms in his relief. His edges, for instance, are well cut back so that the shadows shall be well thrown out. There is not a single detail which misses the point at the distance he required it to tell.

Mr. E. P. WARREN asked if Goujon was credited with the work at the Hôtel Carnavalet? France was at that time affected by the reviving spirit of the Renaissance, and Goujon's work exemplifies it. Goujon must have been in contact with Italians, and it is interesting to note how his work, while giving something of the Italian feeling, is still so full of French vigour that his individualism is never hampered. In that respect he was very remarkable. There is nothing remotely contemporary to Goujon in Western Europe that can hold a candle to him. It is surprising that his influence did not cross the Channel, for England was in constant communication with France.

Mr. LEONARD STOKES, the President, in closing the discussion, described the paper as a literary achievement the like of which was not often heard at the Institute. It appeared to him obvious that it was a great advantage for the sculptor and the architect to be in close contact. In fact, he would go further and say they ought to be combined in one person.

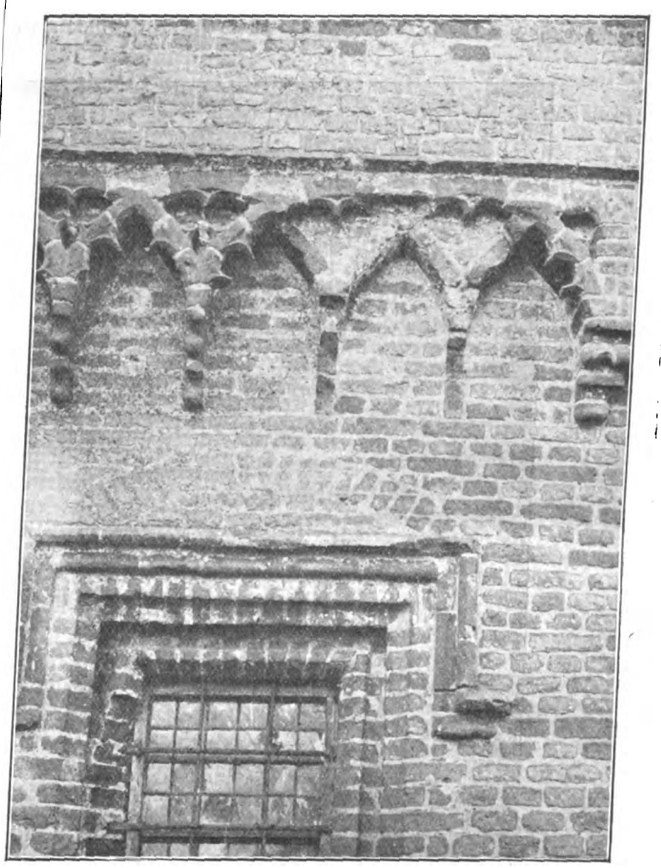
Professor BLOMFIELD, in replying to the discussion, said he was at first afraid he was undertaking a rash performance when he brought such a paper. What had been advanced as to the work of the two men was the result of very careful study of all available evidence. The main point was that whenever Lescot comes in, Goujon comes in with him. It had been pointed out by one of the speakers that the courtyard at the Louvre is not now as designed. This was perfectly true, and allowance must be made for the fact in criticising the effect. He did not go so far as to say there was no evidence that Goujon had acquaintance with Greek work. With regard to the point raised by Mr. Stokes, they were all anxious for architects and sculptors to work together.

THE DEVELOPMENT OF ENGLISH BRICKWORK.*

(Concluded from last week.)

Tudor: General.

ALTHOUGH the use of brick in church building was thus fragmentary and incidental, in house work its possibilities were grasped and a style developed, the most typical of English domestic methods. In cottages and smaller houses brick was early discovered to be a suitable filling for half-timber framing. This brick nogging, as abroad, developed great interest and intricacy, as in a street front at Coggeshall, Essex. Natural enrichment by diaper patterns is an essential feature of Tudor brickwork. Originating in the accidental effects of vitrified headers, its decorative value was soon appreciated. Depending necessarily upon bond, the simplest form of diaper is formed by the dark headers of English or Flemish bond.



BRICK CORBELLING, RYE HOUSE, HERTS.

Regularity of pattern appears less sought after than richness of effect. The diapers particularly on octagonal towers are often unsymmetrical, diagonals beginning and ending with the abruptness of forked lightning. Some remarkably fine pattern work may be seen at the Old Bishop's Palace, Hatfield. In most Tudor work door and window openings were finished in stone, but in the rarer examples with brick mullions, transoms and heads considerable constructional skill is visible.

The square-headed window and straight transom seem to have been a difficulty to be solved by the use of flat arches with radiating voussoirs, a trick to become in Georgian times the motif of a style. Of brick oriel windows few remain, though it might have been expected that its corbelling facilities would have encouraged this treatment. Rye House, Herts, has fine two-light oriels.

Brick Corbelling.

Brick corbelling is a marked feature of the style with a wide range of treatment. Suggested, doubtless, by the machicolated parapets of castellated architecture, it was effectively employed in early brickwork. All the great gateways have brick corbelling, as at Hadleigh, Suffolk, suitably marking its stages. It retained its Gothic flavour well into

* A paper read before the Institute of Builders by Mr. H. Franklyn Murrell, A.R.I.B.A.

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the fifteenth century, as at Layer Marney, though finest in such early work as Rye House.

Chimneys.

The emphasis and interest given to chimneys make them the most characteristic feature of the style. The mere idea of a chimney at all was a new thought to the early Tudor architect, accustomed to let the smoke curl up and blacken the rafters of his Gothic hall. It is notable that in many completely stone buildings fireplace flues and chimneys were carried up throughout in brick, evidencing that at an early date its fire-resisting qualities were appreciated.

Early chimneys were essentially Gothic in their fantastic skyline ; later their detail was elaborated with pattern and moulding. Gothic tradition was long retained in battlemented chimney caps and projecting angles on octagonal shafts reminiscent of gargoyles. With the death of Henry VIII. the elaboration of chimneys ceased. The Elizabethan chimney has a straight stalk and oversailing cap of thin bricks.

The brick newel stairs of the period form an interesting study. They are mainly associated with the early defensive houses, before the prominence given to the upper floors in Elizabeth's times demanded a more spacious stairway. In vaulting under the winding brick treads great constructional ingenuity is shown.

Briefly let us look at some of the famous Tudor mansions in chronological order.

Eton College, partly commenced about 1440, faced in brick with diaper patterns, has very fine chimneys. Its bricks were supplied from a kiln at Slough, still a brick-making district, as shown by the record. "100,000 brike at 10*d.* the thousand, laying by Comanmet of the Erle of Suffolk." Whether the 10*d.* a thousand refers to the price of bricks or the cost of laying, it is equally a startling figure.

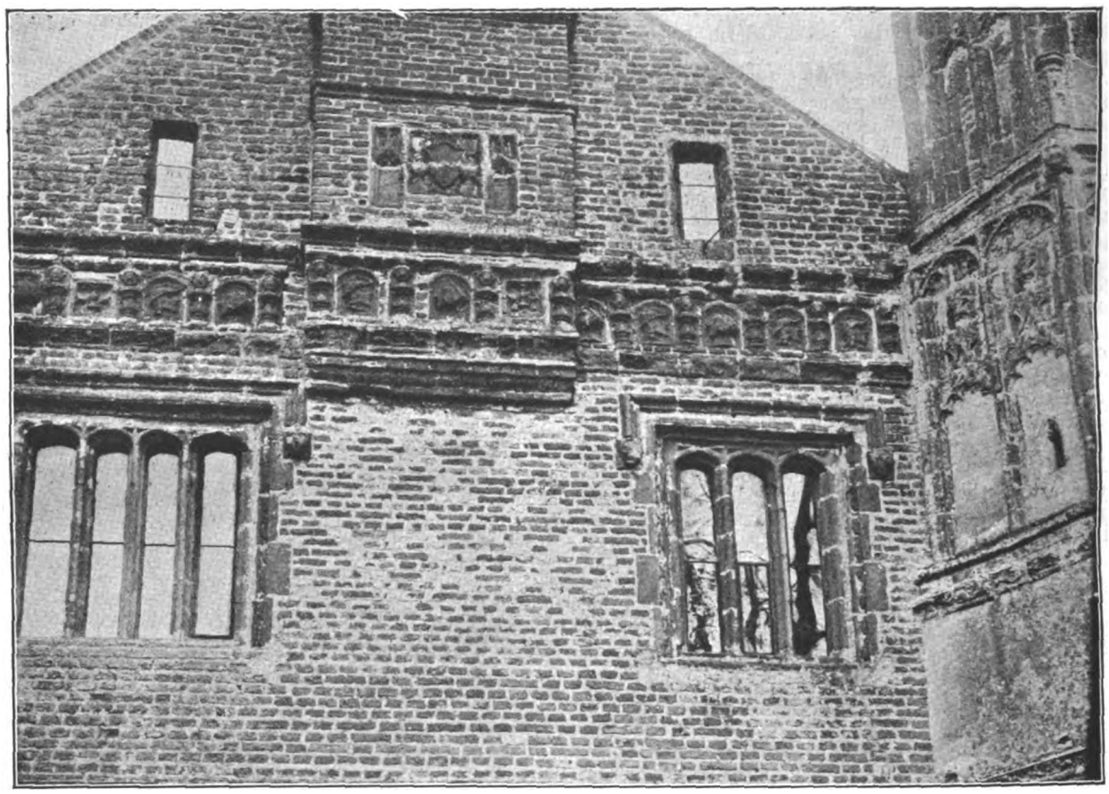
Nether Hall, Essex, is near Rye House, Herts, the scene of the "horrid conspiracy." In both cases only the gate-houses remain, but it is evident that in quality this work was never excelled by the best builders of East Anglia. The construction of the great moulded brick arches at Nether Hall, spanning from turret to turret, is in fine contrast to the trefoil corbelling.

Almost with the turn of the century a new movement was manifested. With the reigns of Henry VII. and Henry VIII., characterised by great domestic building activity, the new Renaissance note, foreign in tone, was struck in all the more famous mansions. With brick architecture approaching its climax foreign influence became more felt, and a new material demanded more in harmony with the brick walling than stone. Hence a new development in English clay art, the introduction of terra-cotta, a material suited by its repetitive richness to the age of the Field of the Cloth of Gold.

Wolterton Manor House, East Barsham, Norfolk, is in many ways the most remarkable brick house now standing. The general building is of the Henry VII. period ; the gate-house appears to have been erected in that of Henry VIII. A panel here, or head there, suggests the Italian terra-cotta worker, but the general architecture is pure Tudor Gothic. Chimneys and turrets, parapets and strings blaze with brick heraldry ; yet even here, with brick and terra-cotta triumphant, a suspicion, possibly as to their durability, induced the use of stone for the inner gateway and in the jambs of the gatehouse arch. The magnificent pageantry of this arch has suffered by the decay of its terra-cotta, apparently burnt solid to a strong dark red.

Great Snoring Rectory, about a mile from East Barsham, is evidently the work of the same builder, but its terra-cotta shows considerably more Italian influence.

Sutton Place, Guildford, one of the great houses of the Henry VIII. period, shows a similar mixture of Tudor and Italian manner in its ornament.



GREAT SNORING RECTORY, NORFOLK.

Hampton Court.—The Tudor portions of Hampton Court have fine brick chimneys. Stone is used for most of the architectural features. The terra-cotta busts of the "Emperors" were imported from Italy.

Little Leigh's Priory, Essex, is yet another example of the home county mansion of this amazing period, built by the Solicitor-General of Henry VIII. Again we have the same arrangement, the fine L-planned portion and the magnificent detached gatehouse.

With the advent of Elizabeth a distinct change becomes noticeable in the building fashion ; brick, though used more widely than in the previous reigns, loses its interest and elaboration for a time with the advance of the Renaissance. This is evident in all the great mansions of the period in every part of the country.

Hatfield House, Hertfordshire ; Bramshill, Hampshire ; Burton Agnes, Yorkshire ; Aston Hall, Warwickshire, and many of the Cambridge colleges are faced in brick, with stone for all ornamental portions, the chimney alone showing an architectural use of brick.

With the development of the Jacobean style brick is again more in evidence, but showing frequently considerable Dutch influence.

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Flemish bond, a term so familiar that we have lost its alien significance, is to be seen for the first time.

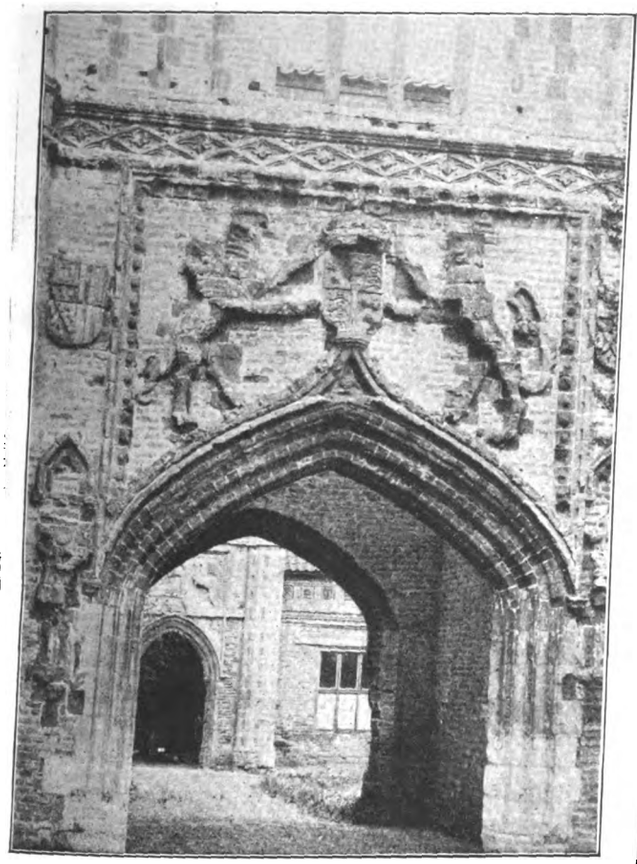
Kew Palace, sometimes called "The Dutch House," is a good illustration. Its window with projecting architraves of 2-inch rubbers have every third course sunk as a rustication. Some of the columns and caps of the central order are of terra-cotta; the cornices are covered with tiles—always an early indication.

The Grammar School at Rye is another good example, showing the picturesque crude Dutch manner.

All up the East Coast this Flemish flavour may be detected, especially at such likely places as Lynn and Great Yarmouth. The free use of stepped and double-curved gables in Norfolk and Suffolk may also be traced to the Low Countries. The tumbling-in of gables is also a great feature of these counties.

Renaissance: General.

On the Continent, apart from Holland and Germany, a few Italian palaces and French châteaux, brick was not greatly in evidence during the Renaissance. Perhaps the key to Renaissance brickwork in this country was the flat rubbed brick arch. Without this, stone lintels must have been introduced for sash windows, and the architectural features of doors and windows have fallen into stone to a very much larger extent.



WOLTERTON MANOR-HOUSE, EAST BARSHAM, NORFOLK.

In brick, as in stone, the orders formed the great decorative resource of Renaissance architects. The small superimposed orders of the Jameses were replaced by the one large order, in brickwork, usually Doric. Heavy Classic cornices were built up of 2½-inch bricks, often with dentils and modillions, tiles being used in early work for the smaller fillet. Effective strings were formed of three or four courses of brick slightly projected. Architectural embellishments have their bricks rubbed to a very fine joint. Fine work, such as Ionic capitals, were made one homogeneous block by the use of a resinous substance, making the joint almost invisible. The natural diaper of vitrified headers is very noticeable, in some districts giving almost the impression of a glazed brick. To this variety of texture was added the interest of broken colour. The contrast gained by employing yellow stock or purple for backgrounds, bonding with reds for windows and groins, once realised became general. Inigo Jones, as his master Palladio, was by no means averse to brick, though using it little in his more important works. In Raynham Hall, Chilham Castle and Stoke Park he used it for facing. St. Paul's, Covent Garden, was probably the first use of brick in Renaissance church building proper.

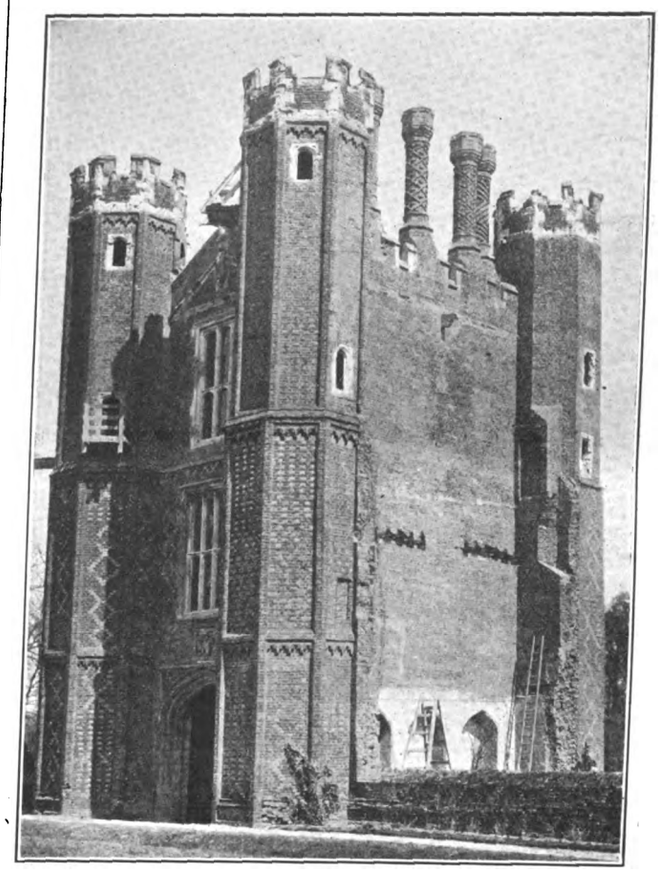
West Woodhay Manor House, an apparently authentic design of Inigo Jones, is the first instance of the typical Renaissance brick house. The old houses in Great Queen Street are of the Inigo Jones period; the combination of the window heads with the aprons of the windows above are suggestive of Pendell House, Bletchingley.

The characteristic strength and decision, the unerring sense of the fitness of things natural to Christopher Wren we find evident in his use of brick. For church work he preferred stone, using brick for constructional portions, and occasionally for economy, as at St. James's, Piccadilly, and the side portions of Bow Church. In domestic work he used it indiscriminately, now for terrace houses on Clapham Common, now for Kensington Palace. Wren's masterly use of colour, with the remarkable quality of his brickwork, are the reason of his success even with such simple elements as seen in Kensington Palace and Chelsea Hospital.

Christ's Hospital, designed in 1672, retained its colour in the heart of the City for more than 200 years.

The Bluecoat School, Westminster, is an almost perfect study in the proper treatment of brickwork.

The famous Banqueting Hall at Kensington Palace indicates an equally fine sympathy with brickwork, with a clear appreciation of its limitation. All carving, coping and sills are stone, while protected portions like the heads of niches are beautifully formed in brick.



LITTLE LEIGHS PRIORY, ESSEX.

At Hampton Court Wren uses his colour broadly. An ordinary dull red on the ground floor contrasts with the bright red of gauged brick above.

The brick style initiated by Inigo Jones and popularised by Wren became the vernacular for the whole of the eighteenth century. For Queen Anne and Georgian alike brick was the medium in which were expressed the comfort and dignity of the English country house.

In town houses, as those in the High Street, Hertford, the orders are more apparent; in these later examples cornices and projections are covered in lead.

Windows are frequently framed with moulded brick architraves. There is a house in the High Street, Farnham, with heavy brick architraves much like a picture-frame round its windows.

The finest examples of the time remaining in London are Nos. 42, 43, 44 St. Martin's Lane. In No. 43 the Roman Doric order is rendered completely in brick, from

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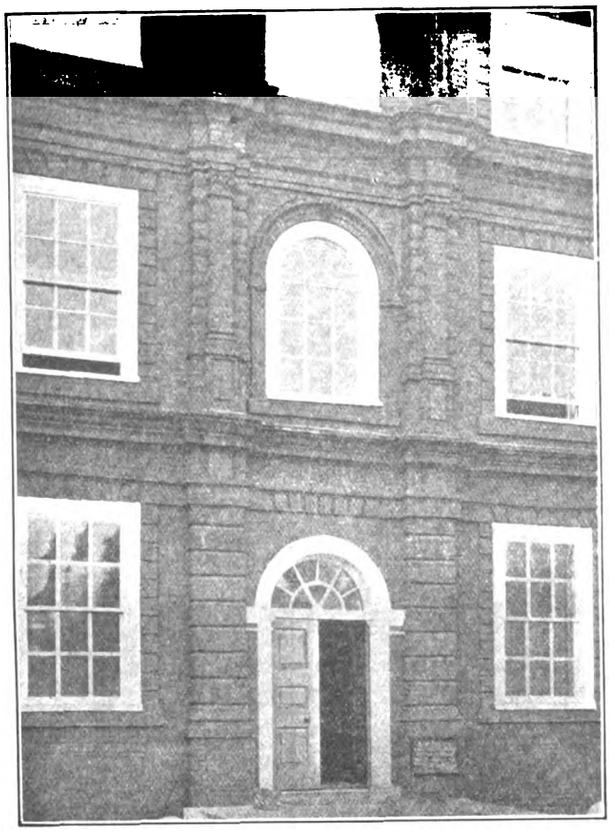
the fluted pilasters to the guttæ on the soffit of the cornice. No. 44 has a correct Ionic cornice with modillions.

The centre pediment from a house at Enfield now preserved in South Kensington Museum marks the climax of Renaissance art in brickwork The example is eloquent, not only of the possibilities of carved brick, but also of the limitations of the material. If the gash of a joint line across love's cheek was originally healed with resin, the wound has been opened with subsequent movings.

1750 to 1800.

The climax of Renaissance brickwork was followed by a decline, hastened by the general introduction of stucco late in the eighteenth century. This militated, as always, not only against the artistic value of brickwork, but also against its constructional quality.

Many of the bulging fronts and rocking party walls which cause our district surveyors sleepless nights may be attributed to the careless brickwork of the age of Nash. The introduction of Suffolk bricks served by their lack of colour only to increase the architectural dulness with which the century closed.



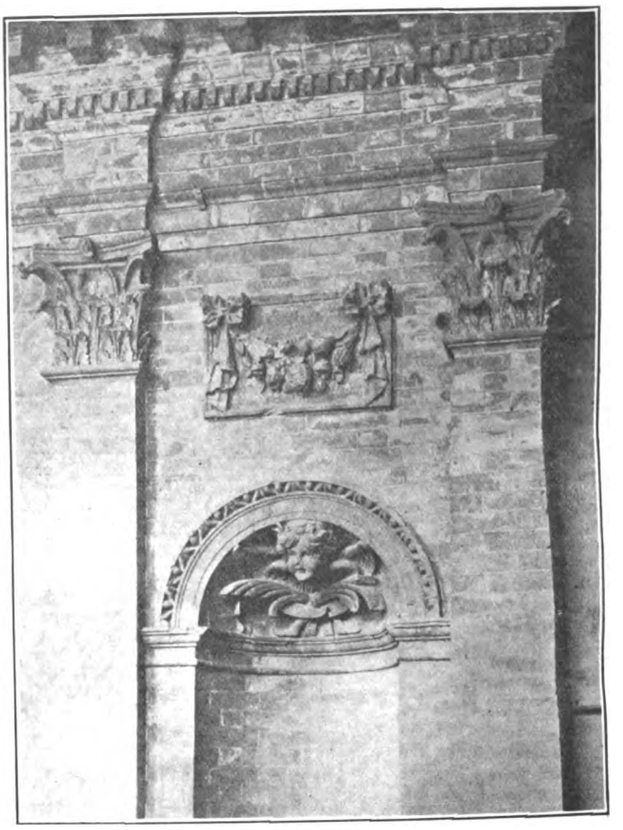
KEW PALACE

The brilliant work of the past century in every sphere of interest is unquestionable; in architecture it was a period of brilliant revivals. To think of these, the Gothic, the Queen Anne, the Georgian, and, if you will, the Byzantine, is to recall to the mind pictures mainly of brick buildings. Although a period of unequalled prosperity it was yet a period of necessarily cheap building, hence brick; but certainly this was no hardship to the Victorian architect.

Pugin doubtless led the way by the inclusion in his "Examples" of the Tudor works at Oxborough, East Barsham, and Great Snoring, stimulating a movement which was to provide almost every parish in the country with its pseudo-Gothic church, parsonage, or schoolhouse, usually brick.

Among other leaders in this Gothic crusade were Butterfield with his pioneering work at All Saints', Margaret Street; Nesfield, with his lodges in Regent's Park; and Street, with his literary research in Northern Italy and practical work in a score of churches. Apart from this introduction of native methods of brickwork in the past and present centuries, a considerable group of buildings exist in which foreign styles have been successfully naturalised in local material; Christ Church, Streatham Hill, is a fine example in yellow stocks. The Westminster Roman Catholic Cathedral, though suggesting to the lay mind a religious power station, to the architect is a successful example of a building of the first importance in brick.

In domestic work, Mr. Norman Shaw's masterly treatment of brick has induced a thousand weaker brethren to cover our town and country side with Queen Anne and Georgian efforts. The scientific development of brickmaking, though increasing the commercial usefulness of bricks, has not equally improved their artistic quality. It has yet to be proved that pressed facings, though included in some Government specifications, will weather as perfectly as have the rubbed bricks of Wren's Banqueting Hall; the possibilities of glazed brick seem first to have been attempted by Butterfield, as in the interior of "All Saints," but in spite of many other interesting essays their architectural use must be admitted to be still in the experimental stage. In conclusion, it is evident that in the past the development of English brickwork has been advanced by alternating periods of use and disuse, of revival and decline, rather than by steady continuous progress;



HOUSE AT ENFIELD - CENTRE PORTION.

That it has attained its present position of general usefulness by a ready adaptability to the complex building requirements of English civilisation;

That in the future, whatever method of construction may determine the course of urban architecture, brick is likely to remain the building material most suited to express the amenities of English country life.

ILLUSTRATIONS.

NOTRE DAME, ROUEN.

OUR illustration is a reproduction of a pen-and-ink drawing by Mr. Laurence Davis, which sufficiently explains itself.

OXFORD COLLEGE SERIES, BALLIOL.—FRONT QUAD.

WE continue this week the views of Balliol College, which we shall complete in our next issue.

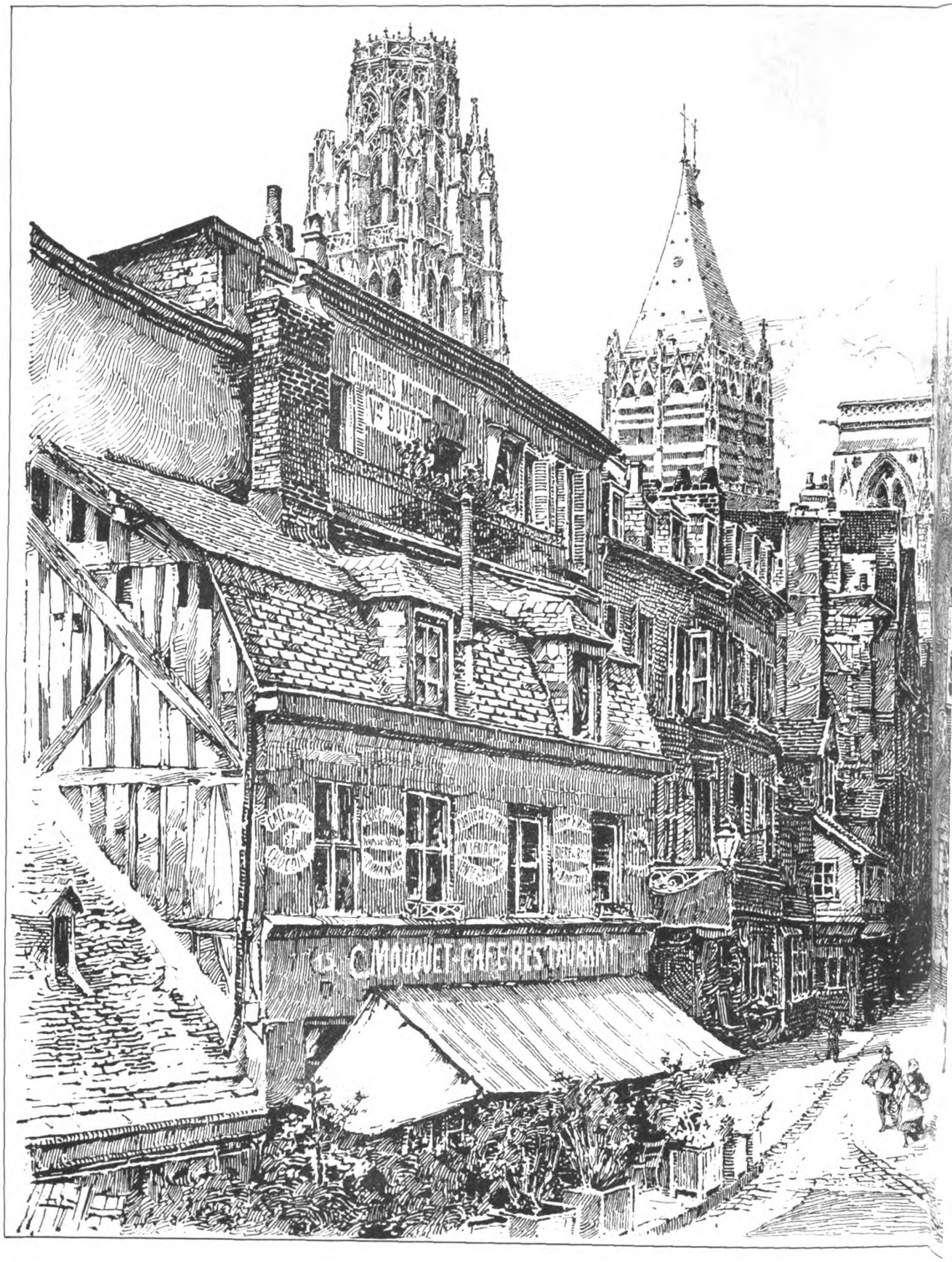
INTERNATIONAL CORRESPONDENCE COLLEGE, KINGSWAY, LONDON. NATIONAL LIBERAL CLUB, GLASGOW.

THESE buildings we illustrate as examples of modern city architecture. The architect of the former is Mr. Harry E. Rider and of the latter Mr. Alex. N. Paterson, F.R.I.B.A.

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NOTRE DAME

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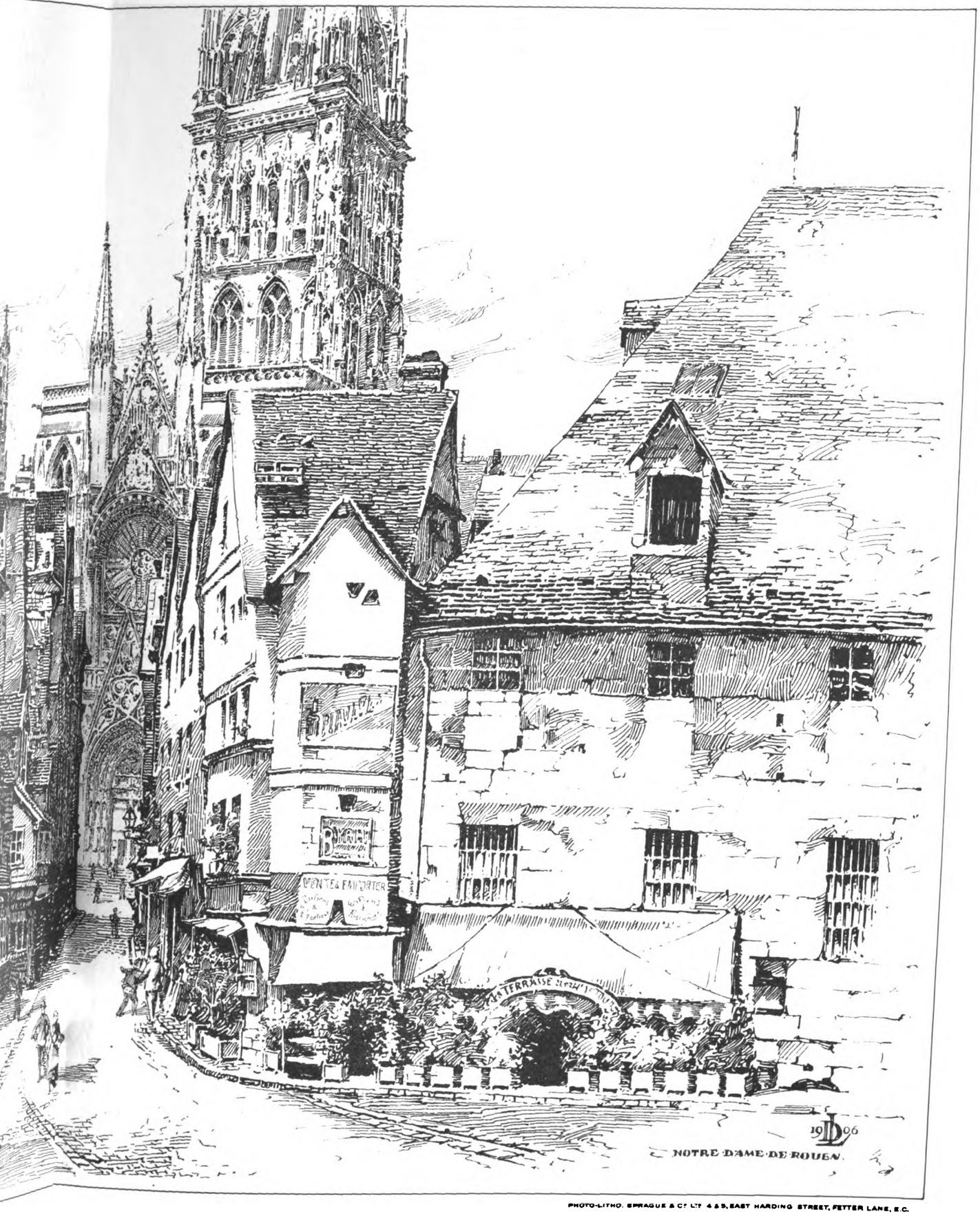


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NOTRE DAME, ROUEN.

A DRAWING BY MR. LAURENCE DAVIS.

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Mr. HARRY E. RIDER, Architect.

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Mr. A. N. PATERSON, M.A., Architect.

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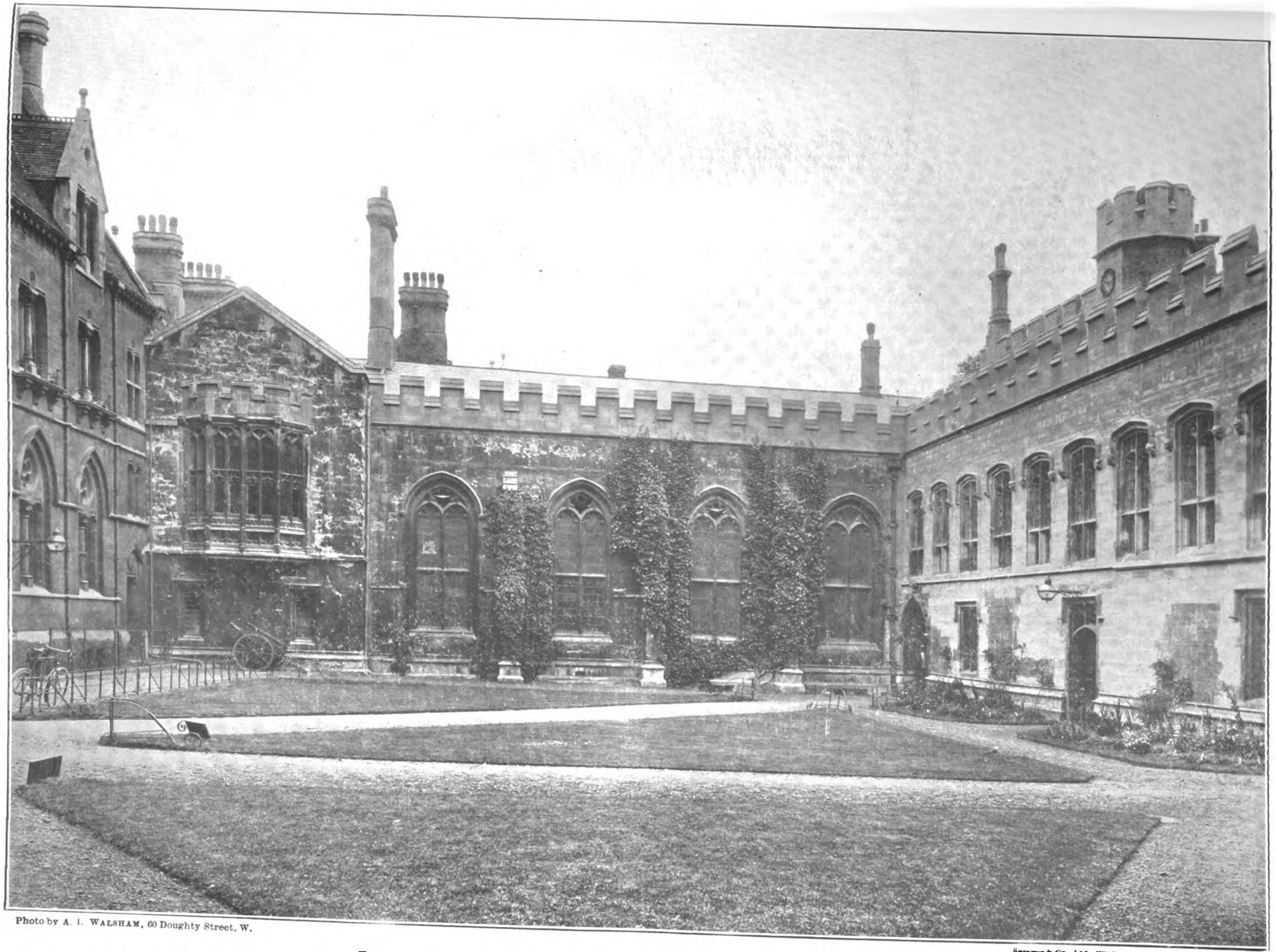


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MODERN COLD STORAGE AND REFRIGERATION.

By W. S. DOUGLAS, B.Sc.

XXIII.—REFRIGERATION IN DAIRIES.

THE treatment of milk, since the days of that renowned bacteriologist Pasteur, has been conducted on scientific lines never dreamt of by our ancestors. Various highly interesting pieces of apparatus are employed, and prominent among these is the refrigerating machine.

The object of the treatment is to eliminate the pathogenic and putrefactive bacteria for which milk has an almost startling affinity. Together with these, certain harmless germs are also absorbed, but it is essential for public health, since some are noxious, that the whole of them should be destroyed. In addition, the milk, when bacterial life has ceased in it, should be rendered proof against the absorption of fresh supplies. These objects are accomplished by first heating the liquid to such a degree that practically all germs are killed off, and then cooling it to a temperature low enough to render it non-receptive.

The actual process will be followed by referring to fig. 74, which shows all the apparatus necessary, with the exception of the refrigerating machine itself. The milk on arriving at the dairy from the farm is strained into the tinned steel receiving tank seen on the right of the illustration, and from there gravitates into the "Pasteurizer" immediately to the left. This apparatus (named after Pasteur) consists of a steam-jacketed vertical cylinder whose internal surface is in shape paraboloidal. By means of rapidly revolving arms the milk is kept in continual motion over the heating area and, by adjustment of the rate of flow, and of the steam supply, is heated to 176° Fahr., at which temperature practically all the bacteria will be destroyed. The arms are driven by a small steam turbine.

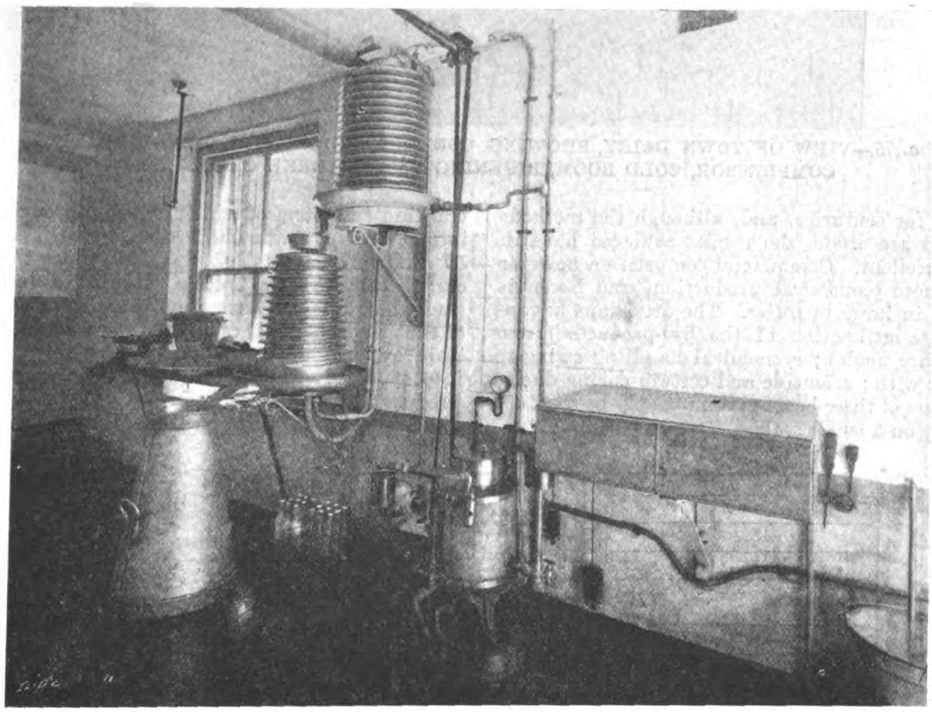


FIG. 74.—PLANT FOR TREATING MILK, INCLUDING "PASTEURIZER" AND TWO COOLERS.

Leaving the pasteuriser the milk is pumped to the top of the primary cooler (for low lifts the centrifugal force obtained from the pasteuriser is sufficient, and the pump is unnecessary). This cooler, which is seen near the ceiling, is cylindrical, and consists of an inner cylinder over which is slipped a corrugated tinned copper mantle, joints being made at top and bottom. In this way flutings are formed through which water, as cold as it can be obtained, circulates in a spiral fashion from bottom to top. During its passage it cools the milk, which flows in a thin stream over the outside of the apparatus, to a temperature within some 4° Fahr. of its own, and thus, if well water is available, the milk will leave the primary cooler at 55° or 56° Fahr.

To render it germ-proof it must be cooled still further, and its final temperature should not be more than 40° Fahr. For this operation the refrigerating machine is required, and its cooling effect is applied through the agency of the usual calcium chloride brine, which is caused to circulate in a secondary cooler, situated so that the milk flows directly on to it as it leaves the primary cooler above. The stock of brine is contained in a large insulated tank, in which are immersed the evaporating coils of the machine, and for some time previous to the arrival of the milk, this is gradually cooled down by the vaporisation of the refrigerant (in this case sulphur dioxide) within the coils. Thus, when the milk is brought in, it can be quickly dealt with owing to the large stock of "cold" which has been accumulated, and the dairyman is saved the expense of putting in a much larger machine.

The milk leaving the secondary cooler is, as seen in the illustration, run straight into the churns. It is then either distributed at once or placed in a cold store, also cooled by the refrigerating plant, until the time for delivery has arrived.

In larger dairies, it sometimes happens that there is a considerable excess of the supply over the demand, and the surplus—to avoid waste—may then be made into butter. A dairy fitted out for this purpose is illustrated in fig. 75, on the right of which will be noticed the horizontal sulphur dioxide compressor. Its condenser, which is of the atmospheric type, is outside, and the brine tank is not seen.

The milk for the town supply is dealt with in the ordinary way, the pasteurizer being seen on the extreme left, and the two coolers not far off. But, if butter is to be made, the milk after leaving the pasteurizer is passed over a water-cooler only, and, leaving it at about 120° Fahr. flows into a separator. In this apparatus it is whirled round at high velocity, with the result that the heavier parts fly to the outside, and the lighter or fatty portions forming the cream remain in the centre. Both these run off by different outlets, and as no further use is found in the dairy for the separated milk, unless cheese is made, it is usually sold either for baking purposes or for feeding pigs. The cream, however, passes onwards to the ripening vats, seen in the middle foreground, where it is inoculated with a pure ferment and, during the space of from twenty-four to forty-eight hours, ripens until it is fit for churning. Its temperature will then be about 68° Fahr., and as before entering the churn (seen behind the vats in the illustration) it must be cooled to about 50° Fahr., the refrigerating machine again comes into use. Its cooling effect, as in the case of the milk, is applied by the circulation of brine through a conical cooler, which will be noticed just above the churn.

The refrigerating machine is also used for cooling stores both for butter and milk, and may be employed to chill the water which is added to the butter during churning. In

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regular creameries where butter-making is the only object, the chilled water tank is an important feature, as from it the water is drawn with which the butter is washed before being despatched.

Refrigeration Applied to the Curing of Bacon.

The curing of hams (witness the celebrated Cumberland and Yorkshire varieties) has been carried on in the country places of England for centuries, and, although the methods employed were and are crude, the results achieved have in many cases been excellent. Commercial competition however has necessitated more economical production, and bacon is now usually cured in large factories. The attendant advantages are, complete utilisation of the bye-products (from which the profits are made); economical handling owing to the quantity dealt with; scientific and certain curing due to refrigeration. None of these benefits can possibly be obtained if the work is only on a small scale.

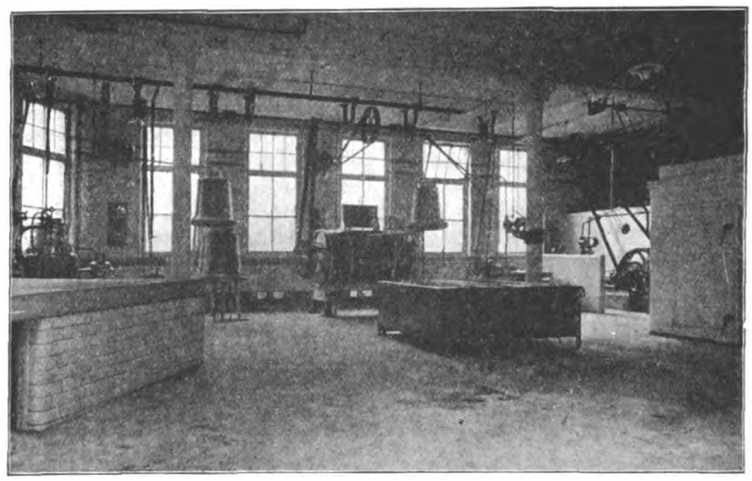


Fig. 75.—VIEW OF TOWN DAIRY, SHOWING COOLERS, HORIZONTAL REFRIGERATING COMPRESSOR, COLD ROOM, RIPENING VATS, BARREL CHURN, &c.

duty of the factory is to produce, from the pig itself, sides of bacon, and, to understand why the refrigerating machine is needed, we must see how this transformation is effected. After being taken from the styes and suspended by the hind legs from the killing bar, the pig is stuck, allowed to bleed, scalded, scraped, singed, then disembowelled, split and allowed to hang in an airy hanging-house till its animal heat has left it. Afterwards, when cool, it is passed by overhead tracking (a system of which extends throughout the factory) into a well insulated chill room, where it is cooled down to 38° Fahr. Then finally it is passed along the tracks into the curing cellar, where pickle is injected into it, and it is stacked in salt for from nine to thirteen days. At the end of that time curing is complete, and we have "green" bacon. This by drying or smoking respectively can be converted into "pale dried" or "smoked" bacon, and the finished product is baled and despatched.

The use of the refrigerating machine therefore is to maintain the required temperatures in cellar and chill room, 38° Fahr. in the case of the latter and 42° Fahr. in the case of the former. Both of these temperatures for successful cures must be very constant, and, as the machine runs only during the daytime, a plentiful supply of brine is necessary.

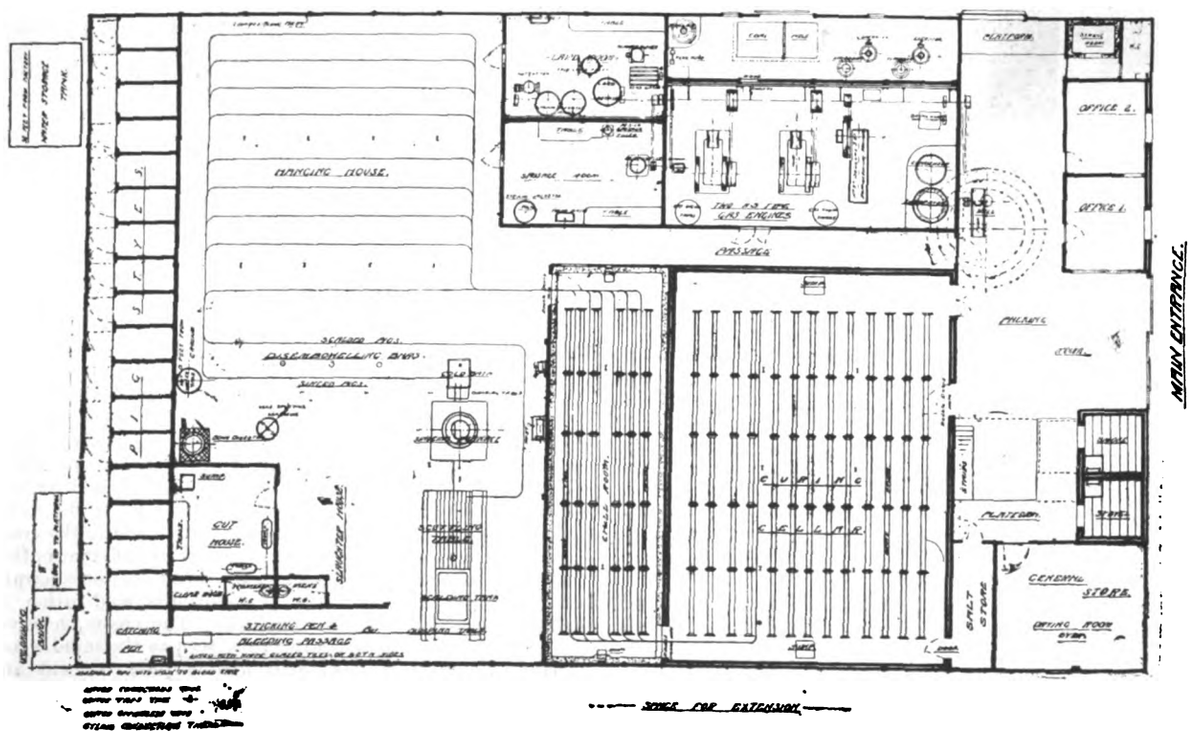


Fig. 76.—PLAN OF 750-PIG BACON FACTORY.

Fig. 76 shows in plan view one of the most recent of these factories, erected in 1909 at Dunmow, Essex. Its capacity is 750 pigs per week, working 10 hours per day.

The bye-products utilised include the lard, blade-bones (made into gelatine and poultry food), intestines (made into sausage skins), offals, scraps (made into sausages), bristles, blood, heads and trotters. By various interesting processes all of these oddments are profitably used up, but the main

The compressor itself, on the sulphur dioxide principle, is horizontal and driven, together with the other machinery, by either of two 43 b.h.p. Tangye gas engines, working on

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suction gas, which is supplied by duplicate producer sets. It is connected to a submerged condenser and to a thickly insulated evaporator tank containing calcium chloride brine, immersed in which are the evaporating coils of the machine. From this tank the chilled brine is circulated by a rotary pump to galvanised cylinders in the cellar and chill room, which offer a large cooling surface, and at the same time form the plentiful storage of cold brine which is required. Above the two rooms is an insulated air-cooler chamber (fitted with inspection and defrosting plugs), inside of which are stacks of piping through which the brine also flows. Over these coils air is circulated by an electrically driven fan, through suitable passage-ways with cut-out slides, from both cellar and chill room and the atmosphere therefore has no chance to become musty.

The insulation of the chill-room ceiling and walls and curing-cellar ceiling is composed of 6 inches silicate cotton, three layers of T. G. & V. matching and one course of waterproof paper. For the floors 10 inches of engine ashes, 1 inch

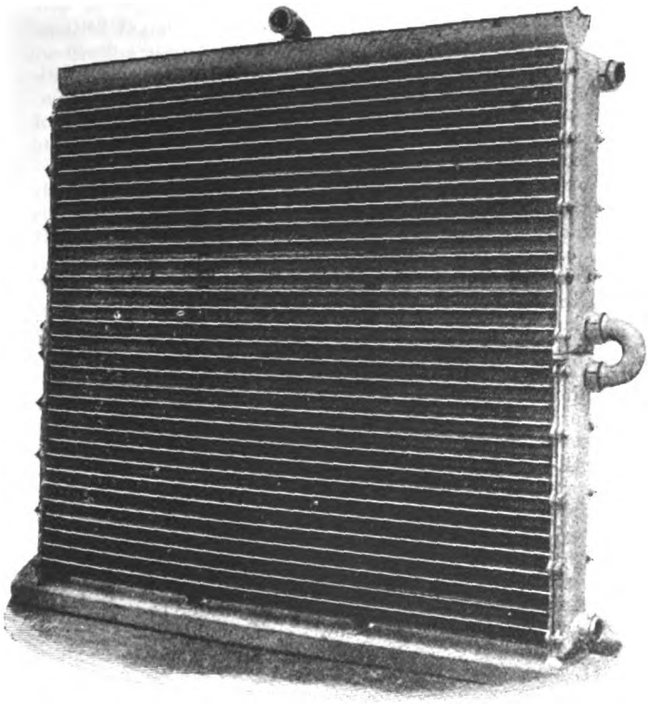


FIG. 77.—WORT COOLER (JOHN DORE)

of bitumen, and 3 inches of concrete are used, and the curing-cellar walls are double, with a 4½-inch air space in between. In addition each of the two walls is hollow, being made, like the rest of the building, from hollow concrete blocks, so that altogether there are three air-spaces to prevent the in-leakage of heat.

Bacon factories are all very similar to the above, no matter whether their capacity is 500 or 5,000 pigs per week, and further description is unnecessary. They are now rising rapidly in numbers, and it is worthy of note that among those owning smaller factories are several landed gentlemen, who have taken this means of stopping the emigration of their estate hands towards the cities.

Refrigeration in Breweries.

In breweries, refrigerating machines have always found a very wide application, but, as it is only seldom that new buildings for brewing purposes are put up, we do not propose, nor does space permit us, to treat the subject with that detail which it deserves.

The processes in making beer by the "English" infusion system (as opposed to the "decoction" system used on the Continent) are crushing, mashing, sparging, boiling, cooling, fermenting, racking, and storing. When the malt reaches the brewery all extraneous matter, stalks, &c., are separated from it, and it is crushed in the malt rolls. Various hardening bodies (maize, rice, &c.), are mixed with it, and it is then mashed with hot water in the mash tun. The effect is to turn the starch of the malt into sugars of three different classes—maltose, malto-dextrins, and dextrins. The latter are almost non-fermentable, but the former split up very easily when mashing is complete. The "sweet wort" which is formed is sparged, i.e. water is sprayed all over the tun from revolving arms and washes the remains of the extract out of the malt. The wort is then boiled up with hops in the brewing copper and passed into the hop-backs, where the albuminous sludge which precipitates out is left behind.

The wort must now be cooled to the proper temperature for fermenting. To this end it is spread out in a shallow iron tray and then run over coolers (fig. 77) somewhat similar to those used for milk. A great part of the cooling is done by water circulation, but as the wort must be reduced to from 55° to 45° Fahr. according to the type of beer (speed being essential to prevent formation of acetic acid) the last stages would be either very slow or impossible using water alone. Accordingly a refrigerating machine is employed.

The cooling effect is applied by circulating chilled water, calcium chloride brine, or the refrigerant itself, through the lower tubes of the cooler. The last-named is the most economical of the three, but in this country it is very seldom used as brewers fear the disastrous effect of a leakage. Even brine for this reason is avoided, and water is most commonly used. For such timidity, however, there is really little reason, as both direct expansion and brine are used in the United States with great success.

The cooling of the wort is by far the largest and most important task which the machine has to undertake in the brewery. Consequently, either a special machine is installed for this purpose or the whole force of the plant is diverted into the one channel, while wort cooling is going on. The other duties, by providing a plentiful store of brine and chilled water, whose temperature has been previously reduced, can during that period very well take care of themselves.

The wort is now pitched with yeast in the fermenting tuns and fermentation commences. This operation is brought about by complex chemical changes, which are all, however, of the one nature, and consist in the reducing of the fermentable malt sugars into alcohol and carbon dioxide. In exciting these reactions the active agent is the yeast, a low form of organism which breathes oxygen and feeds on certain nitrogenous bodies. The latter have been previously prepared for its consumption by the action of certain enzymes (chemical bodies whose action is not understood) in the mash tun.

During fermentation a considerable quantity of heat is developed, which must be removed. For this purpose copper coils known as "attemperators" are immersed in each fermenting tun, and through them chilled water is circulated. The air of the fermenting rooms is also cooled by a separate air cooler, or by brine pipes in the ceiling. Alternatively, only the air in the tuns themselves may be cooled, which is done by covering them in and placing brine pipes inside The object of cooling the air is to maintain the condition of the yeast.

Finally the beer is allowed to settle, and the clear liquid is racked off and stored in casks, which are kept in cellars. These to ensure proper preservation of the beer must be maintained at a temperature of from 33° to 37° Fahr.; and here again the refrigerating machine is employed, not only to cool the casks and to counterbalance the in-leakage of heat through the insulated walls, but in addition to neutralise the heat developed during a further fermentation of the beer which takes place inside the casks.

We have now found three uses for the freezing machine—(1) wort cooling, (2) attemperating, (3) storing. It is also employed for (4) storage of yeast in insulated rooms, (5) storage of hops, (6) quick chilling of bottled beer.

THE PAINT AND VARNISH SOCIETY.

THE standing committee of the Royal Institute of British Architects considered for some time the question of the formulation of standards for materials used in the paint trade, with a view to assisting architects and incidentally the reputable vendors by the drawing up of some more precise definitions of paint materials, and a sub-committee was appointed which eventually published a small pamphlet called "Notes on the Properties and Ingredients of Commercial Paints." On February 10, 1910, Mr. J. W. Lovibond read a paper on "Colour Nomenclature" before the Paint and Varnish Society. The chairman, Dr. M. B. Blackler, stated that the very unsatisfactory methods at present in vogue for matching and recording colours, and the difficulty of obtaining any clear idea as to what was conveyed by any colour name was known to all, and if the system suggested by Mr. Lovibond was taken up and worked on by our manufacturers, very considerable benefit would result. It was also stated that it was too much to hope that

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this system of placing colours on a rational basis would be immediately adopted by our manufacturers; that at the present time no colour standards were known—in fact, they were in a state of continual change—when by fixing colour standards, and defining them by the tintometer, a practical system could be obtained which would be not only advantageous to the user, but also to the manufacturer. On these two considerations, the Council of the Paint and Varnish Society has decided that the following subjects shall be discussed at the next meeting on December 15 at St. Bride's Institute, Bride Lane, Fleet Street, at 8 P.M.:—(1) "Notes on the Properties and Ingredients of Commercial Paints," published by the R.I.B.A. (2) "The Possibility of Introducing a British Standard Colour Card of Paints and Distempers." To obtain a representative gathering, a copy of the following letter has been sent to architects, painters, &c., to whom the discussion will be of considerable interest:—"Dear Sir,—The Council of the Paint and Varnish Society has decided to discuss at its next meeting, the small booklet published by the Royal Institute of British Architects on the 'Properties and Ingredients of Commercial Paints.' As you will observe, the Society has been founded for the advancement of technical knowledge in the paint, varnish, and allied industries, and among its members are architects, painters, manufacturers and technical chemists. The discussion of such a subject will at least call attention to a crying need for a better understanding between the manufacturer and the user. R.I.B.A. committee acknowledged that the subject was extremely complex, and that unanimity of opinion was so lacking that any precise standardisation would not be obtainable for some time to come. The discussion will be opened by the president, Mr. Gaston Depierres, and it is hoped that you will be able to be present and take part. In addition to the above, a subject also of great importance to architects will be brought forward by Mr. A. S. Jennings, i.e., 'The Possibility of Introducing a British Standard Colour Card for Paints and Distempers.' As the Society is an independent body whose object is to benefit the industry as a whole, it has been considered that arrangements may be made whereby the Society could produce a standard of this description, and hand it over to architects and others, so that in the future certain names would apply to definite colours in the standard system.—Yours very faithfully, M. Bennett Blackler, Hon. Secretary. December 1, 1910."

ENGLISH DOMESTIC WORK.—VI.

THE sixth of the course of illustrated lectures on the above subject, by Mr. J. A. Gotch, F.S.A., F.R.I.B.A., was given at University College, Gower Street, W.C., on November 31. It dealt with

The Drawings of Jacobean House Designers.

In all houses which have been continuously occupied for 300 years, said Mr. Gotch, a certain amount of change is sure to have taken place. Consequently, to know how an Elizabethan house appeared to its builder, to know what the designer had in his mind as he developed his ideas, to ascertain just what accommodation was provided and how it was arranged, one has to examine some of the drawings made by designers of that time. Fortunately there have been preserved two important collections of drawings made by surveyors or architects of the time of Elizabeth and James. In addition to these there are, scattered up and down the country, preserved in great houses or the archives of colleges, a number of isolated drawings of that period, which are valuable enough, but they cannot vie in interest with these two collections. Of the latter, one is preserved in the Soane Museum, the other is in the hands of Col. Coke, of Brookhill Hall, near Alfreton.

The Soane Collection is the work (or largely the work) of John Thorpe, who flourished in the time of Elizabeth. The Coke collection is attributable to John Smithson, who was working through the whole of the reign of James I. The two men probably overlapped a few years, and were designing simultaneously; but, speaking broadly, Thorpe is an Elizabethan, Smithson a Jacobean. The Thorpe drawings are well known. The Smithson drawings, on the other hand, were only re-discovered about three years ago.

Mr. Pegge, an antiquary who lived at the close of the eighteenth century, records that drawings of Bolsover Castle, by Huntingdon Smithson, the architect of the building, were in the hands of the Rev. D'Ewes Coke, of Broke Hill, who purchased them at Lord Byron's sale in 1778 or 1779. This architect, he says, died in 1648, and was buried in Bolsover Church. The drawings (among which those of the castle were included) were lost sight of until recently. The first thing that occurs on examining them is a doubt whether they are the work of Huntingdon Smithson. There is no doubt that they are mostly the work of a Smithson, inasmuch as a number of them are so described in a hand rather later in date than the drawings themselves. The only clue to their authorship is an inscription against one of them: "The platte of the Seelinge of the Greate Chamber at Thyballes taken the 8th of November, 1618, by Jo.S." We may fairly consider that "S." stands for Smithson and "Jo." for John, who died in 1634, and furthermore from the handwriting that they are the work of John Smithson, father of Huntingdon; the Smithsons being a family of architects living and working in the neighbourhood of Nottingham.

The drawings are in a varying degree of elaboration. They comprise plans of houses with a few elevations, plans and elevations of stables, surveys of houses and of gardens; details of doorways, windows, screens, chimneypieces, and monuments; as well as drawings of panelling, of fittings, and a few implements. Possibly after Smithson's death an assistant collected the drawings of his eminent master, with a view perhaps to publication, certainly to preservation. There are ninety-nine sheets in all still existing, and of these some seventeen or eighteen cannot be attributed to Smithson.

Thorpe's drawings, on the other hand, were undoubtedly arranged by himself in a bound book. Smithson's are nearly all finished drawings, many of them being executed with great care. Thorpe's are of all sorts; a few are highly finished; the remainder are in all stages of development, down to the merest outlines of a plan or elevation. A very remarkable and clever designer he was, unsurpassed, perhaps, as a planner of houses. Every fresh examination of his drawings increases one's admiration of his ingenuity; and almost every one of his plans has a touch of the grand manner about it.

Seventeen of Smithson's drawings bear dates ranging from 1599 to 1632. Nine of them are dated 1617, 1618, 1619, and from this we may draw the deduction that this Smithson was in full career at that time—a time when John Thorpe must have been approaching the close of his long and busy life. The earliest of Thorpe's drawings is dated 1570, and the latest 1621.

The planning of houses before the middle of the sixteenth century was somewhat haphazard; though subject always to the old-established arrangement which made the hall the chief apartment, and placed it between the family rooms at one end and the servants' quarters at the other. There was but little endeavour to arrange the rooms systematically, far less was there any real attempt at symmetry. As the Italian influence grew stronger, however, symmetry became more highly prized, and by the end of the third quarter of the sixteenth century it had obtained a complete hold of English designers. By the time that Thorpe began to design, this change in ideas was virtually established, and accordingly he made use of various types. The courtyard type at Kirby in 1570; the open-access type at Wollaton in 1580 (where there is no court either within or without the house), the H type in other instances. But whatever type Thorpe adopted, he always treated it symmetrically, and, as the years advanced, the symmetry hardened so that the later examples are more rigidly dealt with than the earlier. The fanciful touches to the elevations, too, which gave so much charm to the earlier buildings, were gradually withheld; the treatment became more staid, the detail more ponderous.

Another very significant change which these drawings illustrate is in the disposition of the hall. Hitherto it had always been the centre or heart of the house. But during the closing years of the sixteenth century and the opening years of the seventeenth this disposition began to be modified. The hall came to be regarded as a separate apartment, not necessarily the centre of the house; sometimes as a vestibule leading to the living-rooms, and not itself the chief living-room. The deposition of the hall from its historic pre-eminence as the principal apartment, and the converting of it into a fine vestibule marks the final severance of the new from the old. With this change mediævalism practically lost its last hold on the English house; henceforward house-planning was to be carried out on new lines. Thorpe and Smithson are the last exponents of the old tradition; the change which their later designs foreshadow was consummated by Inigo Jones and his followers.

At Burghley House, built between 1577 and 1587, the

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Elizabethan designer (presumably Thorpe) was responsible for the courtyard. The symmetry of each façade and of the court is obvious. In the north side was the entrance. There was an outer court formed of narrow buildings. The entrance porch was approached across this outer court, which was imposing enough, although surrounded by inferior rooms. The inner court was arranged on two axial lines at right angles to each other. One passed through the porch, crossed the courtyard, and out through the middle of an open loggia on the south side, then passed through the screens of the great hall, crossed the court, and so through another fine vaulted entrance in the west wing. On the three chief fronts a perfect symmetry was observed.

The plans for Thornton College were on the H plan, and show a change from the traditional treatment of the hall. There is still a screen of a kind at the lower end, but it no longer cuts off a passage from which access to the servants' quarters can be obtained without entering the hall. It is here essential to go into the hall in order to reach the kitchen from the front entrance. Nor does the hall lie in quite the usual way between the kitchen and the parlour. The planning of the ground floor necessitates the provision of several external doorways. In the plans of a house, now known as Holland House, for "Sir Walter Coap at Kensington, p'fected p. me J. T.," the hall is frankly a vestibule. The entrance is central and the traffic to the various doors cuts across the hall in every direction, leaving no space for the dais or for the accommodation of the family. The hall, however, still lies between the two main departments of the house.

Turning from Thorpe's to Smithson's drawings, we find on the whole a later feeling both in the plans, the elevations, and the details. The plans, endorsed "For my lord Sheffield's house, by Smithson," follow largely the traditional type. The house is built round a courtyard, across which the way lies to a raised terrace, where, by turning to the right, the front door is reached in a projecting turret. This is a not infrequent arrangement of the period.

Smithson also supplies several highly interesting examples of the surroundings of houses of the period, as in "The Platforme of my Lo. of Exeter's house at Wymbellton, 1609," where the whole of the splendid gardens are carefully shown.

A STUDY OF BASE AND BEARING PLATES FOR COLUMNS AND BEAMS.

By N. CLIFFORD RICKER, Professor of Architecture, University of Illinois.

(*Continued from page* 320.)

XIII.—TABLE FOR DIMENSIONS OF BASE PLATES.

Fig. 21 is a graphical table for determining by inspection the side of a square, or the diameter of an octagonal or round plate, required to safely transmit loads not exceeding 200 tons (400,000 lbs.), allowing safe pressures of the plate on masonry between 50 and 250 lbs. per square inch. Fig. 22 is merely an enlarged portion of the same table for loads not exceeding 20 tons.

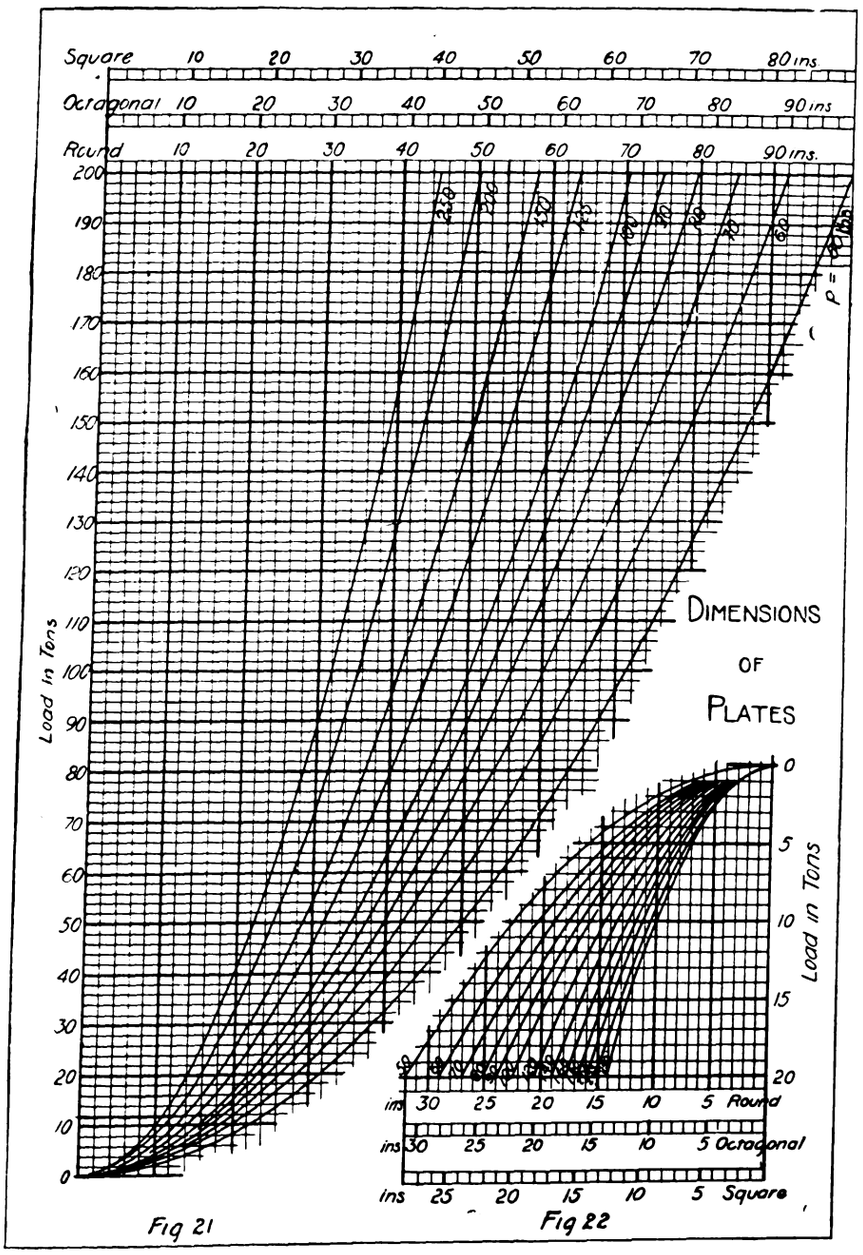


Fig 21 Fig 22

By the use of the upper scale corresponding to the shape of the plate, it is possible to employ this single table for square, octagonal, and circular plates, by reading the required side or diameter on the proper scale.

Example.—A plate is required to safely transmit a load of

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100 tons, allowing a safe pressure of 125 lbs. per square inch on the masonry beneath it.

Locating the intersection of a horizontal through 100 tons with the curve for 125 lbs., and following a vertical through this point to the respective scales at the top of the table, we read the following values :—

40.0 inches = side of a square plate required.
42.0 inches = diameter of an octagonal plate.
45.0 inches = diameter of a circular plate.

Pressures intermediate between the given curves can be easily located with sufficient accuracy.

XIV.—TABLE FOR THE FACTOR $\sqrt{\frac{3P}{B}}$

The general formula for a plate of uniform thickness is

$$t = \sqrt{\frac{3P}{fB}}\,(L' - L'') = \text{thickness in inches.} \qquad (10)$$

This may be factored in the form

$$t = \sqrt{\frac{3P}{B}} \times \sqrt{\frac{L' - L''}{f}} = \text{thickness in inches.}$$

Fig. 23 exhibits the relations of the three quantities.

P = total load in tons transmitted by the plate.

B = length in inches of the fracture section.

$\sqrt{\frac{3P}{B}}$ = one factor in the last formula.

Example.—Take the square plate in the last example. P = 100 tons, B = 40.0 inches. The intersection of a horizontal through 100 tons with the curve for 40.0 inches, and a vertical through this point gives at the top of the table $\sqrt{\frac{3P}{B}} = 122.5$.

Assume that a 12-inch cylindrical cast-iron column with 1¼-inch metal stands on this base plate.

Then $\frac{r}{R} = \frac{4.75}{6.00} = 0.79$, and by the table in fig. 12—

$$L'' = .572 \times 6.00 = 3.43 \text{ inches}; \quad L' = \frac{40}{4} = 10.0 \text{ inches.}$$

Hence $L' - L'' = 10.0 - 3.43 = 6.57$ inches.

XV.—TABLES FOR PLATES OF UNIFORM THICKNESS.

The table in fig. 24 exhibits the relations of the three quantities :—

$\sqrt{\frac{3P}{B}}$ = the factor whose value has just been found from fig. 23.

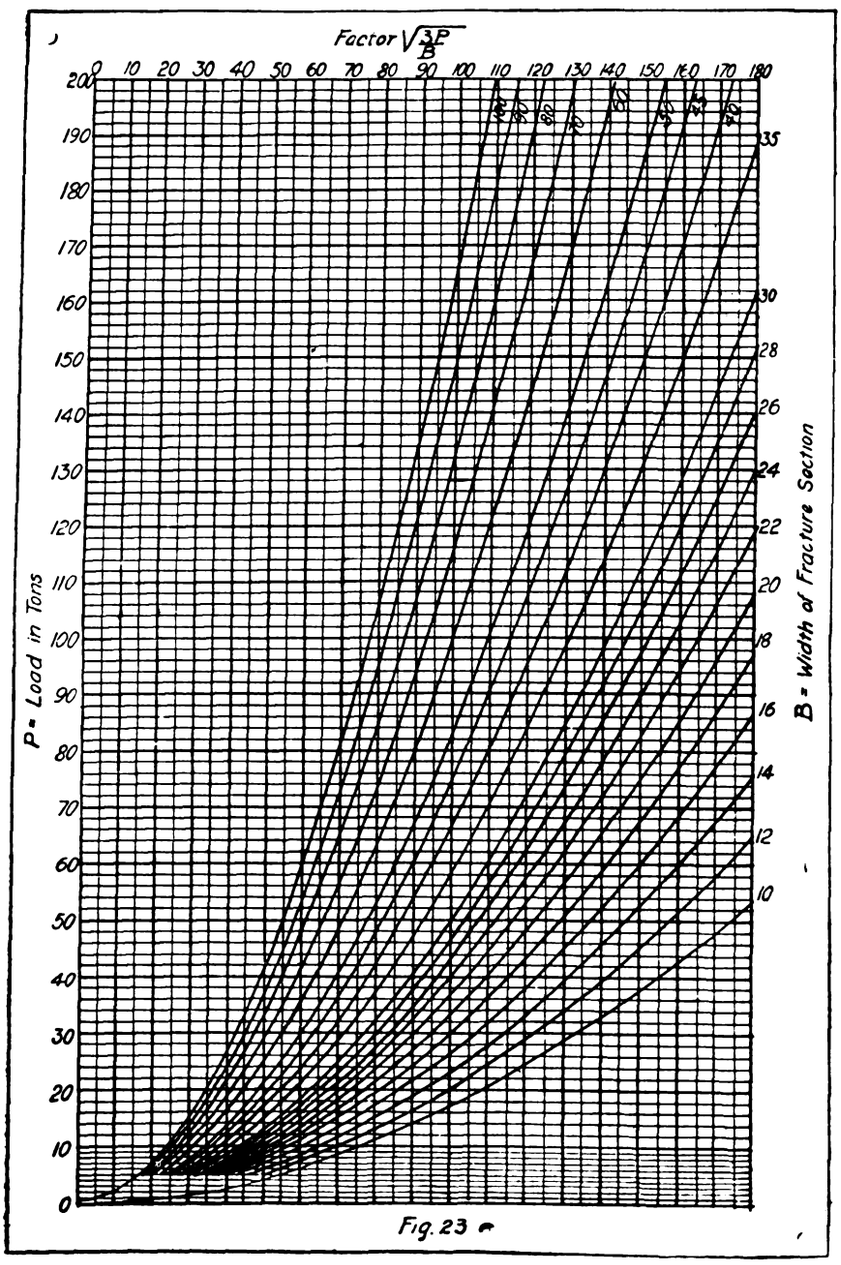


Fig. 23.

$L' - L''$ = difference in lever arms of the upward and downward bending moments.

t = thickness in inches represented by curved lines in the table.

In designing the tables in figs. 24 and 25, the factor $\sqrt{\frac{L' - L''}{f}}$ is actually employed, but the device of separate vertical scales for the different values of f makes the table more convenient for use.

Resuming the last example and employing the table fig. 24, a vertical through 122.5 at the top intersects a horizontal through 6.57 at the left, giving by estimation between the nearest curves the following values for t :—

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MODERN EUROPEAN ARCHITECTURE.

HOLLAND.



[From *Het Huis.*

SALON IN HOUSE ON THE HEERENGRACHT, AMSTERDAM.

$t = 2\frac{1}{2}$ inches for a steel plate.
$t = 2\frac{13}{16}$ inches for a wrought-iron plate.

Employing the table fig. 25 in the same manner for cast-iron plate of uniform thickness :—

$t = 5\frac{3}{4}$ inches for fibre stress of 3,000 lbs. per square inch.
$t = 6\frac{5}{16}$ inches for fibre stress of 2,500 lbs. per square inch.

Assuming 0.20 for the ratio $\frac{t'}{t}$, and $n = 1.17$, by the table, fig. 16, @ = 72.5 per cent.

By formula 12,

$$t = \sqrt{\frac{100}{72.5}} \times 5.75 = 6.76 \text{ inches at middle for } f = 3{,}000 \text{ lbs. per square inch.}$$

$$t = \sqrt{\frac{100}{72.5}} \times 6.31 = 7.41 \text{ inches at middle for } f = 2{,}500 \text{ lbs. per square inch.}$$

Then $6.76 \times 0.2 = 1.35$ inch, and $7.41 \times 0.2 = 1.48$ inch, the respective thicknesses at the edges required.

(To be concluded.)

ARCHITECT'S ACTION FOR WRONGFUL DISMISSAL.

IN the Court of Appeal before the Master of the Rolls and Lords Justices Moulton and Farwell, on the 6th inst., the hearing was concluded of the case of Hodge *v.* the Urban District Council of Matlock Bath and Scarthin, Nick and Nuttall, upon the application of the defendants for judgment or new trial in the action which was tried before Mr. Justice A. T. Lawrence and a special jury.

In this case the plaintiff, an architect, brought an action against the defendants for damages for alleged wrongful dismissal. It appeared that at a meeting of the defendant council, a verbal resolution was passed (the plaintiff being present) that the plaintiff and a Mr. Nuttall should be employed as joint architects for the erection of a Kursaal, and the plaintiff, in accordance with the resolution, prepared plans, and for a time did work in pursuance of the resolution, but before the work was completed the plaintiff was dismissed. He brought the action which came on for trial at the Derby Assizes, when the jury returned a verdict in favour of

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the plaintiff; but as the main defence relied on was that in any event the plaintiff could recover nothing as the contract under which he was employed was not under the Council's seal, the case was argued before the learned judge. Upon further consideration upon that point of law, in London, upon behalf of the plaintiff it was contended that as the Council had had the benefit of the contract, and that as the work done was necessary and had been accepted, the Council must pay although the contract was not under seal. On behalf of the Council, however, it was argued that the contract was one which required to be under seal, and as it was not the plaintiff could recover nothing upon a *quantum meruit*. Mr. Justice A. T. Lawrence held that as the contract was not under seal, the plaintiff could not succeed in an action directly based upon it for breach of contract or for wrongful dismissal. He however held that as the defendants had had the benefit of the plaintiff's work, he could recover the sum of 230*l*., which the jury found he would be entitled to, and he accordingly entered judgment for the plaintiff for 230*l*. and costs, except as to the issue whether the contract was under seal. Defendants now appealed from this decision upon the grounds that the verdict was against the weight of the evidence, and that there had been misdirection by the learned judge.

Mr. Hugo Young, K.C., and Mr. Sandilands appeared for the appellants, and Mr. Shearman, K.C., and Mr. Grimwood Mears for the respondent upon the appeal (the plaintiff). At the conclusion of the arguments of counsel their lordships instead of ordering a new trial reduced the damages from 230*l*. to 118*l*. With that variation the judgment of Mr. Justice A. T. Lawrence was ordered to stand, and the appeal was dismissed, but it was directed that there should be no costs of the appeal.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) has given us illustrations of the interior decoration of the New York Public Library, of which Messrs. Carrere & Hastings are the architects; and two large-sized houses by Messrs. Albro & Lindeberg, in which severe Classic detail of the Doric order is employed.

La Construction Moderne (Paris) illustrates two designs in "Arab style" by Mons. Di Marco, one for a private house, and the other for a tomb; also a new tenement house of good class and elaborate detail at Milan by Mons. Jules U. Arata; and the monument to Jules Ferry, of which Mons. Gustave Michel is the sculptor.

Der Architekt (Vienna) has not this month a great deal that is interesting, designs for a wood-wool spinning mill, and an atelier for art steelwork being the chief items.

Het Huis (Amsterdam) concludes the series of illustrated articles on Oud Deventer, and has a description, with illustrations, of the church at Tholen, which dates from the latter part of the thirteenth and beginning of the fourteenth centuries.

Construction (Toronto) has an article that should be of especial interest to Londoners at the present time on "The Municipal Bridges of Paris." Canadian work, illustrated, includes a good house in Toronto by Messrs. Sproatt & Rolph, a number of inexpensive but effective small houses in Vancouver, and an illustrated article on sand-lime bricks, with examples of Canadian buildings in which these have been used.

Stone (New York) illustrates the Blackstone Hotel, Chicago, and contains several articles on some of the stone and marble quarries of the United States.

Engineering Record (New York) has a valuable article on "Investigations on the slip of rods imbedded in concrete," by Mr. H. Burchartz.

ARCHÆOLOGICAL AND ETHNOLOGICAL INVESTIGATIONS IN SARDINIA.*

MR. D. MACKENZIE reports:—"This year's campaign in Sardinia was attended by the singular good fortune that had favoured our explorations of former years. Six more dolmen tombs were added to our list of four of last year, making ten monuments altogether of this kind which have been discovered by us. The significance of this discovery may be realised from the fact that, previous to our researches of last year and this, only one monument of this class was known in Sardinia—that near Bironi, referred to by Montelius, and since published by Taramelli. The general scientific result accordingly is that we can now say definitely not only that the great Tombs of the Giants were developed from an earlier type of dolmen tomb, as has been conjectured by Montelius and others, but that this development took place on the soil of Sardinia itself. The mysterious civilisation of the dolmen people has long been a puzzle to archæologists. We can now, however, confidently say that in Sardinia at least this dolmen culture represents an early episode in the great Bronze Age civilisation of the Nuraghi.

"A curious circumstance came out in the course of these researches. The dolmens in no case showed that juxtaposition to the Nuraghi which we had previously found to be so constant a concomitant phenomenon in the case of the Tombs of the Giants. One might as well have been in Corsica! And it is well known that in the sister island there are no Nuraghi, and that there the dolmen type of tomb survived throughout the Bronze Age.

"The last part of our campaign was devoted to a partial exploration of the country to westward of Macomer called Planargia as far as Cuglieri and the sea.

"The Nuraghi in this whole region are of the very greatest importance, especially from the point of view of their strategic significance. They form a regular network as far as the sea, and one can see by studying their positions of vantage that they are all directly or indirectly in signalling communication with each other. They are, as Mr. Newton has well remarked, regular block-houses which might very well be compared with those which have performed so prominent a part in modern warfare as, for example, in the final stages of the Transvaal war."

* Abstract of a report presented to the British Association at Sheffield, 1910.

Correspondence.

[The Editor will not be responsible for the opinions expressed by Correspondents.]

New Land Taxes.—Increment Value Duty.

SIR,—As I understand there is considerable doubt as to how far small house-owners and friendly societies are exempted from increment value duty, I should be obliged if you would publish this letter.

The only exemption for small house-owners is contained in Section 8 of the Finance Act, which provides that in boroughs of over 50,000 population any house of an annual value of 26*l*. or under is exempt when it is and has been for twelve months previous to the date on which the duty is to be collected occupied by its owner; in smaller places the limit is 16*l*.

If a house, however small, is let or not occupied by its owner it has no exemption whatever, and is as fully liable to increment duty as any property belonging to the wealthiest owner.

The exemption to friendly societies from increment value duty is under Section 37, and only applies to the collection of what is called periodic duty, which is the increment duty to be collected every fifteen years from corporate bodies in place of the increment duty to be collected on the death of private owners. There is no exemption whatever to friendly societies from increment value duty when they sell their property or let it on building lease. They are also fully liable to reversion duty on the falling-in of any ground rents they have purchased as an investment.—I am, &c.,

E. G. PRETYMAN.

Orwell Park, Ipswich: December 5, 1910.

Walton-on-the-Hill Church.

SIR,—I have read Mr. Randolph's letter in last week's issue with great interest, and should be much obliged if he would say where the thirty folio volumes are that he mentions, as I may be glad to refer to some of them.—I am, yours faithfully,

A. E. DOYLE.

33 Seymour Road, Harringay, N.: December 5, 1910.

MR. HENRY ADAMS, M.Inst.C.E., who has already served ten years as chairman of the examination board of the Society of Architects, has been again re-elected to that position.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, December 16.

Architectural Association : Visit to new Wesleyan Methodist Church House, Tothill Street, Westminster, S.W.

Monday, December 19.

Royal Institute of British Architects : Business meeting.

Liverpool Architectural Society : Dr. T. W. Naylor Barlow, medical officer of health, on "The Effect of Defective House Drainage on Health."

Tuesday, December 20.

Institute of Sanitary Engineers : Mr. Alban M. Scott on "Building Construction, so far as it relates to Sanitation." (Students' lecture.)

A NEW BOOK ON BUILDING CONSTRUCTION.

THE young student of architecture is already confronted with a wide range of choice in the matter of books on building construction, good, bad and indifferent. Some are cheap and good, others are better and more expensive. It may therefore be predicated that there is no urgent need for another new book on the subject, and if such another is to find a place it must in some way be superior to those already in the field. The standard set by the present favourites amongst students' books is a high one, which renders the more difficult the attainment by a newcomer of a place in the front rank.

The projectors of the series of books to form "The Architect's Library" have made a good start with two volumes on history, and may therefore be considered justified in assuming that their typical library would not be complete without some equally good volumes on building construction. Thus we have now offered the first of two which makes a bid for recognition as a standard text-book on the subject.*

In this first volume the four authors each treat of a different section : Professor BERESFORD PITE of brickwork ; Mr. BAGGALLAY of stonework ; Mr. SEARLES-WOOD of carpentry ; Mr. SPRAGUE of construction in metals. Under such a division of authorship it is only natural that the book as a whole is not marked by uniformity of style or treatment ; but this is of small consequence if in exchange for a literary blemish we obtain the advantage of different subjects treated by experts in a particular branch.

Professor PITE's contribution is of unequal merit, and does not place the latest exposition of brick construction on a markedly higher plane than that attained by previous writers. There is an obvious and praiseworthy desire to teach the young architectural student principles, but the Professor is more in evidence than the teacher, so that the principles enunciated, being insufficiently supported by facts, tend to become platitudes. Thus, for example, the student is told that "the foundation afforded by the site should be of sufficient strength to carry the weight of the building uniformly and firmly," but the only indication of the bearing power of soils is that "the subsoil of London generally will not sustain a greater weight than about 1½ tons per superficial foot." The general principle is laid down that weight may be spread over a greater area of ground by the use of wider concrete, but the student is not informed precisely to what extent the concrete must be made thicker with an increase of width, nor at what point it becomes desirable to substitute the concrete-and-steel raft of which an illustration is given.

This illustration is not quite satisfactory. The bottom course of footings is shown to rest direct on the transverse joists, which are placed at 2-feet centres. It would have been desirable to have doubled the courses of the footings so as to introduce longitudinal bond, or to have placed the joists lower, with a thickness of concrete to convey the whole weight of the wall to the joists.

In his description of piles Professor Pite draws a distinction between bearing piles and friction piles. He thus recognises what a great many text-books ignore, that piles may bear a load without being driven into a solid bottom, but he does not go quite far enough and explain that the friction on their sides is an important element in the bearing power of all piles ; and he is in error in teaching that piles are driven until they will "drive no further." In all wise pile-driving the penetration of the piles is stopped at some determined point of small sinking, so that they all have an equal and calculable bearing power, whether this is due to friction or the solidity of the bottom reached, and quite independent of the depth.

We regret to see that the tyro in building construction is taught an obviously illogical rule-of-thumb method for determining the thickness of concrete beds in foundations. The thickness of concrete is not regulated by the thickness of the wall, except in so far as this connotes amount of weight, but it is vitally affected by the amount of projection beyond the footings, which finds no consideration in the Professor's method. The *reductio ad absurdum* of the rule-of-thumb occurs when the footings are in double courses, an excellent method, which is ignored.

It is to be feared that a careful reader would be puzzled to harmonise the dictum on p. 21, that "Brick and stone walls should be built of non-porous materials," with the statement on p. 45 that "The porosity of all walling materials in ordinary use is considerable." It is of little use to enunciate principles of perfection if these are incompatible with the possibilities of fact.

A principle of construction in brickwork that is very frequently omitted in text-books, though well understood by the jerry-builder, is admirably explained—the natural bracketing of brickwork over openings.

Many young practitioners have experienced serious trouble by attempting to follow advice often given in text-books, and repeated in the volume before us, as to the use of Hygeian Rock and similar compounds in half-inch cavities. It can be done successfully, but demands abnormal skill and care that are not often forthcoming from the average British workman. The description of the construction of cavity walls does not enter sufficiently

* *The Architect's Library. Building Construction.* In Two Volumes. Vol. I. By Beresford Pite, F.R.I.B.A., Professor of Architecture, College of Art ; Frank T. Baggallay, F.R.I.B.A. ; H. D. Searles-Wood, F.R.I.B.A. ; E. Sprague, Assoc.M.Inst.C.E. (Longmans, Green & Co. 18*s.* net.)

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into detail, and in fig. 14 the connection of cavity and damp-course as shown is absolutely wrong.

VITRUVIUS and his theory of the setting of mortar are hardly worthy of a place in the serious consideration of the subject. The Professor's explanation is far preferable, though, like many other writers, he does not sufficiently distinguish between setting and induration, which are not by any means the same thing nor necessarily simultaneous.

Portland cement receives quite inadequate treatment, and the description of its vitally important qualifications is vague to an extreme, as, for example, the statement that "The fineness of ground cement can be ascertained by feeling it with the fingers." And this in the days of 180 by 180 sieves.

It is a pleasure to be able to turn from fault-finding to the perusal of Chapters v. and vi., in which the purpose and use of bond, moulded brickwork, fixings, openings, and pointing, fireplaces, and flues are excellently described and illustrated.

Mr. BAGGALLAY's contribution on stonework is the finest exposition of masons' work that we know in any English text-book of general building construction. The description of building stones is scientific without being abstruse, up to date and comprehensive without being unduly detailed. The tools and methods of stoneworking, with their resultant styles of masonry, are well explained, whilst the principles and practice of stereotomy are fully elucidated by a well-chosen series of examples that should enable the student to thoroughly grasp the essentials of this important but too much neglected branch of an architect's education.

Carpentry is the subject of a very short chapter, and suggests the idea that the carpenter is rapidly on the way to become in modern building construction no more than the man who makes the centering, forms, and shuttering for reinforced concrete. Occasionally in cottage building he may construct single-joisted floors and small and simple roofs. Even stud-partitions are not considered by Mr. SEARLES-WOOD, "as their place is taken by the numerous more or less fire-resisting partitions now in use." The work that is left for the poor carpenter is well described, and incidentally we are pleased to note that a correct connection of cavity and damp-course in hollow-wall construction is shown in fig. 121.

Mr. SPRAGUE, in his treatment of construction in metal, does not follow Mr. SEARLES-WOOD's example, but reserves a place for the cast-iron girder, which he considers may still be used on occasion, and of the designing of which he therefore imparts instruction.

The design and construction of wrought iron and steel are well explained, particular attention being given to the details of joints and connections, and methods of calculation, chiefly graphic, are explained for various forms of girders, stanchions, and roofs, as well as for simple problems in reinforced concrete. Thus the architectural student has here before him a sufficient introduction to construction in metal for all ordinary cases.

"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

WE are gratified to find a renewal of interest and activity in the work of the Club, to the members of which sketching rather than measuring seems to appeal.

Mr. J. BERNARD MENDHAM sends a drawing of a characteristic Cotswold house, the Manor House, Upper Swell, Gloucester. This expresses the architecture well without being pictorial, though as a pen-and-ink drawing it is somewhat defective in "values."

Mr. W. A. ROBB submits a perspective sketch of Rowallan Castle, Ayrshire, boldly and broadly treated, in which there is a commendable study of light and shade and some appreciation of values. For a perfect drawing the building is scarcely sufficiently put into the middle distance, and hence, as so often occurs in architects' drawings, rather jumps out of the picture.

"L'Quayt" gives us a view of the south prospect of Harewood House, near Leeds, which, by inclusion of the garden as a foreground, achieves the desirable middle distance position for the building. There is scarcely sufficient emphasis of light and shade in the drawing, which consequently suffers from flatness of effect.

"J. E." has drawn one of the well-known half-timber houses at Chiddingstone, in Kent. For a perspective the drawing is too much of a diagram, hard and mechanical in effect from the employment of ruled lines and a laboured monotony of rendering.

"Sans Peur" has sent a series of five sheets of sketches which give evidence of careful study of the essentials of pen-and-ink drawing and promise of future ability of no small degree. "The Market Place, Hexham," is a good attempt at the rendering of atmosphere, and is also good in composition. "Old Houses, Gilesgate, Hexham," "Old Inn, Elvet, Durham," and "Wakeman's House, Ripon, Yorks," are good examples of the topographical sketch, the record of quaint old work. "Old Cottage, The Green, Ely," is the least satisfactory of the series, neither frankly a record nor well composed and studied in value for pictorial effect. "Grainger's Porch, Ely," is a good study in values, but there is too much monotony in the rendering of the varied textures of the different surfaces.

The relative excellence of much of the work we have received for the month of November is so closely on an equality that we have decided to divide the prize equally between Mr. J. BERNARD MENDHAM, Mr. W. A. ROBB, "L'Quayt," and "Sans Peur."

ROYAL ACADEMY OF ARTS.

THE President of the Royal Academy of Arts (Sir Edward Poynter) gave away the prizes to the successful students of the Academy schools on Saturday evening last.

In his address to the students, the President thus spoke of the particular sections of the schools in which we are especially interested:—

"The competition in the designs for the decoration of a public building, which in my experience has been steadily improving from year to year, is this year of unusual excellence. There is none of the careless work which is sometimes to be found among them, and there are at least three of distinguished merit. Here, I think, the counsels of one at least of your visitors, who has directed you to make studies of composition from the works of the Great Masters in the National Gallery, has been of signal service.

"The architectural school has risen of late years to a high standard of excellence owing to the zeal and devotion of your visitors. And the same may be said of the school of modelling. Though it is to be regretted that there is so small an attendance in the modelling school in the daytime, there has been an extraordinary change in the condition of sculpture in this country within the last thirty years; there is now a great school second to none in Europe. Among its most distinguished members are your visitors; and it seems a pity that more advantage is not taken of the instruction to be obtained from them."

The following is the list of prizes and prize-winners:—

Landscape painting, Wild Flower Growth by a River Bank—Creswick Prize (30*l.*), Margaret L. Williams.

Design in monochrome for a figure picture, The Flight of the Assyrians on hearing of the Death of Holofernes (Judith, chap. xiv, and xv.).—Armitage prizes, 1st (30*l.*) and bronze medal, Gerald L. Brockhurst; 2nd (10*l.*), Margaret L. Williams.

Design for the decoration of a portion of a public building, Bathers—prize (40*l.*), Ralph Longstaff.

Cartoon of a draped figure, A Seated Veiled Figure suggestive of Silence—silver medal and prize (25*l.*), Margaret L. Williams.

Painting of a figure from the life—silver medal, 1st, Katherine F. Clausen; 2nd, Cecil A. Hunt.

Painting of a head from the life—silver medal, 1st, John H. Gardiner; 2nd, Margaret Hodgson.

Perspective drawing in outline (open to painters and sculptors only), The Library of the Royal Academy, looking towards the Quadrangle—silver medal, no competition.

Set of six drawings of a figure from the life—1st prize (20*l.*) and silver medal, Margaret L. Williams; 2nd (15*l.*), Leopold L. Swain*; 3rd (10*l.*), Tobias Lewis.

Set of three studies of drapery—silver medal, Mabel Edwards.

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Model of a design, The Entombment: group of four figures—St. Mark, chap. xv., v. 46; St. John, chap. xix., v. 40, *et seq.*—1st prize (30*l.*), Percy B. Baker; 2nd (10*l.*), Newbury A. Trent.*

Model of a bust from the life—silver medal, 1st, Percy B. Baker; silver medal, 2nd, James Booth.

Model of a design containing figure and ornament, A Wall Drinking Fountain—prize (5*l*) and silver medal, Edmund T. W. Ware.

Model of a medal or coin, A Design to Commemorate the Federation of South Africa: Obverse and Reverse—prize (5*l.*) and silver medal, Newbury A. Trent.

Set of four models of a figure from the life—1st prize (20*l.*) and silver medal, Newbury A. Trent; 2nd (15*l.*), Percy B. Baker.*

Design in architecture, A Loggia in a Public Garden, with a Concert Room behind opening from it—travelling studentship (60*l.*), Adrian Berrington.

Set of architectural drawings, The "College" at Westminster School, containing the Long Dormitory exclusive of the Sanatorium at the South End, but inclusive of the Entrance and Stair at the North End—silver medal, 1st, John C. Rogers; 2nd, Wilfrid S. Owen.

Design in architecture—prize (25*l.*), Leonard H. Bucknell.

Perspective drawing in outline (open to architects only). Greenwich Hospital: A View of one of the two Domed Towers, with one or two Bays of the adjoining Colonnade—silver medal, Augustus G. Bryett.

Original composition in ornament—prize (10*l.*), Jas. M. Whitelaw.

Set of drawings of an architectural design—1st prize (15*l.*), Jas. M. Whitelaw; 2nd (10*l.*), Alan G. Brace.

Architectural design with coloured decoration, One Side Bay of an Aisle-less Church or Chapel—silver medal, not awarded.

* Disqualified owing to having received the same prize before.

Landseer Scholarships of 40*l.* a year each, tenable for one year have been awarded—In painting to Charles V. Holder and Florence M. Walden; in sculpture, to John Angel and Alfred H. Wilkinson.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary general meeting of the Architectural Association, held jointly with the Camera Sketch and Debate Club took place on Monday, the 12th inst., Mr. Arthur Keen, President, in the chair.

The nominations of Mr. Raymond Unwin and Mr. A. O. Hector were announced. Mr. Keen stated that the Life Class, under Professor Alston, will begin on January 11. The fee for the course of twenty-four evenings has been fixed at 1*l.* 4*s.* Attention was called to the two drawings of Norman Shaw's work recently presented to the Association, which were displayed on the walls.

Mr. G. LEONARD ELKINGTON then read his paper on—

That Foreign Study and Travel Retard the Development of a National Style.

All styles of architecture in the past have owed their origin primarily to a desire to build in beauty, for from this desire there arose, in a perfectly natural way, a seeking after novelty. This seeking led to the production of new forms, and of these, those that gave most pleasure were reproduced. Thus the styles came about, to wax and to wane, to live or to die as the future might decide.

From a genesis such as this to the culmination of any style is a long step, for the evolution of architecture, depending as it does on external conditions, must necessarily be slow. It is owing to imperfect knowledge, insufficient appreciation, and even complete ignorance of very many of these external conditions, that a proper understanding of architecture is so extraordinarily difficult. It is for these reasons that architecture is so often regarded from an entirely wrong standpoint, with unfortunate results, I am afraid, for the impression thereby gained is presented in false perspective, and the lesson to be learnt is misread. Not only is this to the detriment of the learner, but when his learning is subsequently applied in the exercise of his art it is to the detriment of that art also. This, in my view, is one of the ever-present dangers of too close a study of the architecture of the past.

Let me endeavour to explain by taking the architecture of a civilisation which, in its relation to other co-existent civilisations, occupied a position more or less analogous to that held by our own State at the present time. I refer to the Roman Empire. There we find a people whose dominating influence led to colonial expansion, a people with cities great and small, patricians and plebs, plenty and poverty, virtue and vice, intellect and ignorance—possessing, in fact, all the concomitant elements in greater or less degree of a highly developed civilisation. The lesson to be learnt from its architecture should surely be applicable to our own. Has it been learnt with advantage? I say "No." Can it be learnt? I say "No." And why not? I think for several reasons.

First and foremost, I suggest that it is beyond human power for any student to so blind himself to the state of civilisation in which he has been brought up that he could sufficiently suppress his own entity in the attempt to correctly realise a state which existed centuries ago. I say that it is impossible for him, though he knows from beginning to end such contemporary literature and history as have come down to us, to acquire sufficient intimate knowledge of Roman ideals and of Roman ways to become, in fact, sufficiently Roman to appreciate, or to depreciate, except by hazard, the merits of the Roman style. If this be so, how, I ask, is he to form a proper judgment of Roman architecture? And in the absence of a proper judgment, how could he form a correct estimate of its worth? How can he tell with any pretence to accuracy the extent to which it met the conditions of life that then existed, the extent to which it reflected the knowledge of the day when it flourished? And yet to my mind it is imperative that this knowledge should be first obtained if the result of the study is to be of practical value to him, for without that knowledge he may be led into merely wasting his time.

But I shall be told the object of our study is not to see how far Roman architecture was suited to the requirements of the Roman civilisation, but to inquire into its suitability for the requirements of this present day. What a palpable admission of enfeebled faculties does not the mere nature of this inquiry convey, what indisputable evidence does it not afford of forgetfulness of that consistently progressive movement that has characterised the slow evolution of architecture from its crudest beginnings? And yet it is an inquiry that has unblushingly been made but a short time ago in our architectural history, for unfortunate reasons, and with a disastrous result, as I will endeavour to explain later.

For the present let me remind you of several factors that intervene to prevent the accurate determination of an inquiry of such a trifling nature. The examples of Roman architecture that remain to us are in varying states of decay. They are very few in number, spread, too, over a wide area. In their pristine beauty, when they might have been able to impart more information than they can now give us, they would have surely represented different values in the architectural scale. These remaining examples represent also, comparatively speaking, a narrow range of types or classes of buildings. Here, then, is the field of your inquiry—a field of wide boundaries but producing a limited crop. Your equipment for the task I will assume to be as perfect as that I have insisted on a little while ago as essential. You spend five years or so in indefatigable study, sketching, measuring, photographing what exists, in exercising your imagination to restore what has gone—an ideal student in fact.

You will, like an architectural jackal, unearth the moss of ages to uncover the bones of a dead past, but the soul of that past is beyond your grasp. You may discover in your ghoulish task how those bones were joined one to the other, but the spirit in which they were so joined you cannot reveal, for it is gone.

You will come back with a superficial knowledge of the outward forms of two or three or more individual units of that vast fabric of Roman architecture—only a superficial knowledge, I say, backed with plenty of conjecture. You will read a paper before this Association or the Institute, which will be favourably received. You will perhaps be inveigled into writing a book on the subject, whereby many another student may be led from the correct path. But you will have learnt nothing that will tend to advance the architecture of to-day. Your first job will probably be as dismal a failure as can be imagined, and your first client, when he has his second commission to give, will look up some old studio friend of yours who did not get the Travelling Studentship.

I have mentioned Roman architecture as an instance where the conditions by which it grew and flourished are only imperfectly known to us to-day, but I do hold that similar difficulties arise to prevent a true understanding of other architectures, such as those of Egypt, Greece, and the mediæval Church, amongst others. And without that true understanding being obtained I ask of the form of study we have under consideration, *Cui bono?*

I do not say that we should not study them at all, for I

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cannot conceive any architectural training of value that does not include in its syllabus a comprehensive review of the development of architecture in the sequence of historic styles. But that review, to my mind, should play the same part in the training as does the learning of Latin and Greek as dead languages in the education of a cultured English gentleman —that is to say, it should be a means only to an end. I believe that an all-sufficient knowledge of the architecture of the past can now be acquired without spending perhaps the most valuable part of your life in seeking it in person on the spot, for it is in those years that immediately follow the student's career as a pupil or in the schools that his mind is in its most expansive condition and when impressions of a lasting nature are received most readily. It is cruel to suggest that such a mind is worthily employed in attempting to unravel problems of the past in some out-of-the-way place abroad, and with all the difficulties I have mentioned in the way of obtaining a proper understanding. And when it is recollected that it is the most promising students that meet this fate, I say it is nothing less than intellectual ostracism of the worst type by the powers that be, in the shape of those architectural autocrats who control the immediate destinies of our students. Perhaps, however, they are jealous of dawning genius, and regard travelling studentships as a species of architectural Siberia.

Now, I hold that those five years of the lives of our most promising students would be better devoted to unravelling the problems of the present in their own native land. Goodness knows there are national problems enough to be unravelled, and it is surely only by unravelling them that a national style will be developed. As we get older we are inevitably more and more inclined to shirk serious attempt at their solution, so engrossed do we become in building up a balance at our bank. It is the young men such as those I have indicated who should be in the front rank of the force tackling those problems. Why, then, consign them to outpost duty? This is the principle of the proposition I submit to you.

It is not for me to indicate precisely how those services could best be utilised for the purpose I have in view, but I offer as a mere suggestion that, say, a Minister of Fine Arts should have the bestowal of a number of commissions in connection with some of our public buildings. Instead of a travelling studentship the successful student, the student with knowledge, should have one of these commissions given to him. His training would have been such, if the principle of my proposition be recognised, as would enable him to make the best of this reward for his study, and I cannot help thinking that by this means the cause of a national architecture would be advanced, if only by indirect means at first. I have too much confidence in the value of the "young man" in architecture to think otherwise.

Contrast the position I have suggested with that which obtains. What interest does the public take in our travelling students? Does it really care whether the influence of the travelling students' work upon current architecture is for good or for bad? It cannot even decide, because it is in possession of no criterion by which the work may be judged.

Reward the successful student as I have indicated, set the people a national standard they can look up to, and I believe much will be done to awaken public interest in him and in his work, and, what is more important, in architecture generally. And then architecture will advance appreciably, the good architect will make his 10 per cent. as easily as he now makes his 5 per cent. with difficulty, and the cry of the registrationist will no longer be heard in the land.

But this happy state is, unfortunately, mere suggestion.

I have referred, very superficially, I am afraid, to some of the dangers attending architectural study abroad in referring to what we understand as real or serious study, and the observations I made with regard to the particular instance I took apply with greater or less force to all styles of architecture, of no matter what age or country other than our own.

I do not think it necessary to make more than a brief mention of that form of travel and study which is sometimes advocated as conducive to the enlarging of our view. I allude, of course, to that hurried, casual sort of study which is done with a portmanteau in one hand and a sketch-book in the other. I have never heard it seriously claimed for it that it is of any lasting or material benefit to anybody. It admittedly enlarges the view, whatever that may mean precisely. But the process, though pleasant, is not always desirable, for the brain is liable to be overfed with mental food not easily or quickly assimilated, so to speak, and the mind is apt to suffer in consequence from the nasty effects of an architectural indigestion. A good deal, of course, depends on the patient, but traces of the malady are often discernible in his subsequent work.

In some cases you will find an advocate of this view-enlarging process who will argue that he has never suffered from the ill-effects I have mentioned. It is a line of argument somewhat analogous to the contention that So-and-So must be a good citizen because he has never been locked up; but before you accept his argument look carefully to see whether it is not a case of a brain so empty that it can never be fed sufficiently, much less overfed.

The chief objection I have, from the point of view of the development of a national style, to this form of travelling study is the tendency it fosters to introduce alien features into the work of the student or practitioner. In these enlightened days I will not even hint at mere copyism, but I do say that, however strong a man may be to avoid any conscious imitation, he is bound to be influenced subconsciously by what he has seen. For that reason I hold he should confine his study to his own country when his work is to lead to the development of a national style.

Now, those who are unable to accept my proposition must of necessity take the view that foreign study and travel do not retard the development of a national style. To prove their contention properly would involve them in the necessity of subjecting the condition and value of architectural art in England at the present day to a critical examination and estimate. I think this should only be undertaken by those whose special qualifications fit them for the task, for it is obvious that the field of inquiry would be so vast, and the bases and factors of valuation so diverse, that the task would be stupendous.

But presume that that task were undertaken not by those who will oppose me, but by the most capable and enlightened jury that you could imagine. I think you would find that every member of the jury would deem it necessary to present a separate report of a nature conflicting with the reports of his colleagues. In fact, I believe that they would only agree upon one opinion with any approach to unanimity, and that is that much, but not all, of our current architecture is deplorably unsatisfactory.

With that view you will agree, because disagreement would imply some sense, at any rate, of satisfaction in things as they are, an attitude that cannot be even dreamt of as an attribute of the true artist or sincere student. But whether you agree or not really does not matter. The reasons prompting your action, whatever it may be, are exactly similar to those which would have compelled my jury to approximate or diverge in their attempt to estimate the worth of our current architecture; and, strange to say, it is for analogous reasons that each member of my jury would be able to support his colleagues in that one opinion to which they all could subscribe.

It is simply a matter of ideals. You, and the members of my jury, only regard the problem from the point of view of seeing how far yours or their particular ideals are satisfied. It is from the adoption of these personal points of view that we obtain collective criticism of a more or less indeterminate nature and of dubious value. Thereby are we deprived of any trustworthy information as to whether we individually are groping in the dark and wasting our time, or working properly as we should to the advancement of architecture. It is no mere difficulty of the imagination this, the lack of opportunity of obtaining trustworthy information. It is a difficulty I have experienced myself, and one which, I venture to think, has been felt at some time or other by all thinking students of architecture. It is a difficulty that should be promptly removed.

I am forced to the conclusion that if there could be substituted for the disquieting variety of our individual ideals one definite and noble aim in architecture that would appeal so irresistibly to all of us, from the Royal Academician downwards to the merest tyro in the Architectural Association School, that we were voluntarily drawn with all the enthusiasm and fervour that you can imagine to work consistently and loyally to its attempted realisation, then, not only would the difficulty to which I have referred be removed, but you would have an architecture with a purpose—an architecture worth living for.

What that definite aim should properly be is a subject worthy of separate inquiry; but obviously to be of the value I have in my mind it must be an ideal of so lofty a standard that it can never be fully attained. But I do suggest that a truly national style is a most excellent substitute to go on with, and it is to hasten, if it be possible, the development of this that I ask you to agree to my proposition this evening.

I do not think that anyone will question the statement that in pre-Renaissance days the æsthetic value of the build-

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ings was largely achieved with the assistance of a potent force exercised by the Church on the builders, a force which compelled each workman of his very faith to make his work beautiful. We must admit, too, having regard to the haphazard building methods of the time, that the architecture was singularly successful and beautiful, and that when judged, so far as we can now do so, from the point of view of fitness it is fully endowed with national characteristics. Now, one of the reasons why this architecture was so successful was that it had progressed slowly on the lines by which all the great styles of the past had matured—that is to say, by means of knowledge supplied by tradition, and with an aim of an inspiring nature always in view. The objective of this aim is now often difficult to determine in many cases, and yet we feel instinctively that it really existed. And for so long as the change in social condition and the advancement of knowledge had proceeded slowly so long did tradition prosper and so long had the evolution of architecture kept pace.

At the Renaissance social conditions changed so rapidly, and knowledge leapt forward at such a bound, that architecture by evolution was left behind, and so died the old order as the living expression of the day. But it was a lingering death, for tradition dies hard.

Now, one of the most interesting outcomes of the new order was the initial appearance on the scene of the architect in the sense that the word is understood to-day. Henceforward the knowledge and practice of all that architecture means was to be centred in the individual. The destiny of architecture lay in the lap of the future and in the hands of the architects. How has architecture fared at their hands in this country? The rise and fall of Anglo-Palladianism, the rise and fall of Anglo-Greek, the battle of the styles, the rise and fall of the Gothic revival, the age of eclecticism, our present position—do not these point all too forcibly to the only answer we can honestly give to my question? Surely we are not proud of so gloomy a record of bright hopes recurring only to be snuffed out in dismal failure. It points, only too eloquently, I think, to the fact that our predecessors have squandered the glorious inheritance left us by Inigo Jones and Wren, and that they have failed in their trusteeship of the trust reposed in them by the Renaissance.

This is not the time or place for us to consider all the external circumstances which may have led to the sorry state I have mentioned, for I admit that the architects of the period were not wholly to blame. It is only necessary for us to reflect now upon the two factors which, in my view, undoubtedly conduced to this degeneration, in order that we shall not similarly fail in handling so much of the inheritance as remains to us. These two factors are the head and tail of my proposition.

It was the absence of any definite aim, such as that which characterised pre-Renaissance architecture, the lack of a definite end such as I suggest would be afforded by a national style, that led to the restlessness, the readiness to clutch at straws, the helplessness that is only too apparent in many of the works of the period under observation. It was the want of this moving spirit that led to the gradual misunderstanding of the principles and the misapplication of the essentials of architecture that can be discerned all too clearly in the works of even a few years ago.

It was surely, I think, the recognition of this lack of definite aim that led to the establishment of various schools of thought and writing which, by the extraordinary fervour and bitterness with which they assailed their opponents, have done so much to belittle the architect in the estimation of the public, and so little to rectify, except in a cumulative sense, what they knew to be wrong. It was the outcome of this lack of definite aim that led to the practice of extensive travel and study, whereby we have been involved in various gymnastics with the principles of our art. Thanks to the practice, the architects of a few generations ago became adepts in conjuring with the details of architecture, but they found it essential to reassure the public in the oft-repeated cry, "There is really no deception!"

I do not think it will be seriously maintained that any of those spasms, passing phases, or fashions—call them what you will—which I have mentioned can be considered as a development of that architecture which gave us the work of Wren, and I do not think it essential to quote at the present time any particular instances as tending to prove or disprove my case, for whilst I am prepared to admit that individually very many of the buildings of the period I accuse are not without some merit of their own—regarding them from the standpoint of their neighbours—I think we should remember that it is not the work of the few that makes the architecture of the day, but the work of the many. And for that reason I prefer to take a wide view.

Now, though the past has been gloomy, the clouds that have lowered on our architecture are lifting to reveal a horizon rosy with the dawn of enlightenment and full of good promise for the future. I suppose that the advocates of foreign travel and study will claim the credit for this. But though I would give the devil his due, I think this pleasing prospect results rather as the first-fruits of the school instruction in architecture so happily introduced by the foundation of this Association. The system, to my mind, sets a definite aim before the student, even if that aim be so lowly as a desire to please his instructor, and the collective working it affords to an ideal, if it only be the personal ideal of the master, is a step in the right direction to promoting the spirit that educated the mediæval builder with such success.

I say that foreign travel and study may have been necessary in the days when primary architectural education was only to be acquired in the form of pupilage to an individual master of more or less doubtful capacity or willingness to teach, but I contend that the result of the practice on the development of our architecture was disastrous. And I therefore ask you to say that at the present time foreign travel and study are not essential, and, from your own knowledge and experience rather than from this poor advocacy of mine, to agree that they retard the development of a national style.

Mr. C. G. BOUTCHER, in opening the discussion, maintained that foreign study and travel do not retard the development of a national style. From the very earliest times our architecture had been under the influence of foreign travel, for the simple reason that travelling is a characteristic of the race. Yet there has been a perfectly national style, the development of which has been in no way retarded by this influence. Henry III. was inspired by what he saw in France, and Amiens and Rheims are reflected in Westminster. Indeed, the pointed arch itself, the very nucleus of the whole style, has been attributed to the Eastern influence on the Crusaders. Architect-bishops like Lanfranc, Anselm, and St. Hugh of Lincoln were all foreigners. The Renaissance was brought about by foreign study travel. Yet was François's premier work like Jacobean, or Mansard's work like Wren's? Wren visited France at the time when all the great artists of the reign of Louis XIV. were at their zenith. His correspondence shows he surveyed the cupola of Les Invalides, the Louvre, and many other buildings with a full appreciation of their beauties and a due sense of their defects. But the development of English Renaissance was not thereby retarded. Wren saw these things, was inspired by them, and then went home and tackled his own English problem in his own English way. The entirely national style that resulted was the outcome of national requirements and national temperament. So long as these two factors were the chief consideration it was impossible for its development to be retarded.

Mr. Elkington's description of a budding genius sent to an architectural Siberia for five years and wasting the most promising time of his life in the ghoulish task of unearthing the remains of a dead past was misleading. No travelling student other than, perhaps, a Prix de Rome man would ever think of spending his time in that way. Another type of travelling student had been suggested, who carried a portmanteau in one hand and sketch-book in the other. Judging by the work brought home, it would not appear as if many travelling students habitually sketched in that manner. On the other hand, the genuine, earnest student had been ignored—the man who, after passing through the schools and winning a travelling studentship, sets sail and sees under their own skies all the marvellous productions he has read about. At the end of his holiday he returns with a few sketches and measured drawings—for outward and visible signs. But a metamorphosis has taken place, and he returns equipped with every weapon to overcome difficulties, and ready to tackle national problems. Mr. Elkington's scheme whereby the best students upon completing their schooling should be given a commission was preposterous, and would prove disastrous for the development of anything national or otherwise.

The best way to understand external conditions is to see the examples remaining; an hour spent in their company will give more inspiration and instruction than a week of reading about them. Mr. Elkington said that all styles of architecture in the past have owed their origin primarily to a desire to build in beauty. But it follows from this that any form which is beautiful and suits our national requirements and our national temperament should be used. Therefore there should be one definite idea in the mind of every student, one underlying principle which must never be lost

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sight of, and that is fitness. If a building is well suited for the purpose for which it was designed in plan, construction, and appearance, then it is good architecture. If it does not serve the purpose for which it was intended, then it is bad architecture. If the student keeps this beacon burning in front of him, letting no other consideration put it out, or even dim it for a single moment, it is certain that while foreign travel and study will increase his knowledge, will inspire him to great thoughts, it will never in any way retard the development of our national style.

Mr. ARTHUR T. BOLTON recalled the fact that the point under discussion had come up some years ago when someone attacked the idea of going abroad, and the line taken up in answer was that abroad things are on a very much broader scale than in this country. The buildings abroad are, indeed, generally speaking, enormous in scale. A young fellow, said Mr. Bolton, recently came to see him who had much the same idea as to the futility of foreign travel. In the course of conversation Mr. Bolton said he asked him how he would know whether a cornice should be 3 feet or 4 feet in depth, and the young fellow replied that he would know by experience. But experience could not be got in a better way than by study abroad. It is such study which gives the young architect confidence to do what is asked of him. The study of the actual handling of things can be acquired on a larger scale and with greater facility abroad than here. One of the great advantages is that away the student is free from all distractions, and he can stick to his job from early morn to late at night. He is also met in a very different spirit, sometimes the whole building being put at his disposal. On one occasion, when he himself was at Seville Cathedral, he sought permission to go up a scaffold that happened to be in position; the courtly priest at once gave leave, and added that the entire place was at his disposal—and so it was. The same facilities were again offered to him in a French cathedral. Such facilities seem difficult to obtain in this country. Facts like these should be considered in considering the question under discussion. Undoubtedly all the great architects of the past have been great students of what has been done before. Inigo Jones and Wren were both cases in point. The idea of building in accordance with the spirit of the past has prevailed at all times and periods. In the early Middle Ages they were under the impression they were building in the grand Roman manner. It is known that many of the Greek artists travelled in Egypt. In fact, there never has been any period in which the past has not been largely drawn upon. It would seem as if that always must be so. The line of argument which Mr. Elkington might have adopted was the enormous amount of harm done by those who simply make a rapid tour abroad, returning filled with enthusiasm, but for that which has been imperfectly digested. Suppose such a student arrived at Rouen and there saw the famous circular staircase; he would doubtless be fascinated, and it is conceivable he might come back and proceed to build something like it. If he had spent a longer time in France he would have seen that circular staircases are indigenous to the country, and that the one at Rouen was simply the last word. In England he would find that circular staircases were comparatively rare, while square newel staircases are common. It would be unfortunate if English students became inspired by a mistaken patriotism, and believed that nothing was to be learnt abroad. The student who has completed his studies would do well to see a style like that of the Egyptians, in which the main effects are gained by means which are wholly unfamiliar to present-day practice. It is recorded in the life of Sir Charles Barry that a visit to Egypt produced a great effect on him. Or, again, the architecture of Spain possesses qualities which could never be seen in England. English Renaissance was about a hundred years behind that of Italy, and yet the English architects who went to Italy when the Baroque was prevalent there suffered no harm from seeing work that was inferior to that of a hundred years earlier. They simply ignored it. There did not, in fact, seem any fear of the effects which would follow English students going abroad and studying foreign architecture.

Mr. H. H. STATHAM said that he had expected when they talked about a national style that they would have been referred back to Gothic, which is the English national style, if there is such a thing. They had been attacked for not carrying on the tradition of Inigo Jones and Wren. But he would like to ask where Jones (who was not called Inigo until after his return from Italy) got his style from; surely he was an example in favour of foreign travel! When Elmes designed St. George's Hall, Liverpool, he treated the sides with a pure Corinthian order; whereas the end portion is treated with square massive columns interrupted by a screen wall. This latter is an Egyptian idea translated into the form of Greek he was trying to work out. What, he would ask, was wanted with a national style of architecture? The time for that was past. When national architectures were worked out each country was cut off from communication with the rest of the world, and each worked out the peculiarities of its own style without much temptation to reproduce what was done elsewhere. Now the means of travel have been so facilitated that it is almost impossible for any one country to remain apart as in the Middle Ages. The Japanese are beginning to erect their public buildings in what is called the European style. The varying climates of the different countries remain unaltered, however, so that this will have an effect on detail. It is impossible now to use the argument that what suits one country does not suit another. We are coming to a universal style for the whole civilised world. Apart from that, the study of all styles must be advantageous. The whole of architecture is connected so wonderfully that there is not a single building unaffected by what has gone before it. The man who studies the most will be the most original, for his mind will be furnished with ideas for new suggestions. It is impossible, however, to get a real idea of a building without seeing the building itself.

Mr. H. COX thought that the title of the paper was somewhat inappropriate, for it should rather have been something in the nature of "The Use and Abuse of Foreign Travel." With reference to the question of national style, it would seem as if there never had been one which has not been affected by foreign travel. And a national style is not made by the architect, but by the wish of the people, just as it is the men who make the age, and not the age the men. Internationalisation would produce a cosmopolitan style for the world. The Gothic cathedral in Calcutta was no doubt the wish of those who paid for it rather than of the architect who designed it. In concluding, he would like to protest against the use of the word "*debate*" at these meetings, as opposed to "discussion." A debate is likely to lead people to a lawyer-like attitude, and it might produce rhetoric, but not eloquence. The advantages of foreign travel were further advocated by Mr. H. B. Elkington, Mr. L. M. Yetts, Mr. Alan L. Snow, Mr. V. R. Talvalker, and Mr. H. W. Brittan.

Mr. HERBERT A. HALL asked if the most interesting work of to-day was done by men who have travelled abroad. He was inclined to think that such would be found to be the case. If there was one thing in this country which might be claimed as a national style it is the domestic work. Yet Mr. Norman Shaw, who has done so much towards attaining that end, is a most voracious traveller.

Mr. D. A. FORSTER considered that the question which Mr. Elkington should answer was, "What is a national style?" The paper had tried to put them off foreign travel, but had only succeeded in confirming their desire to take it. It was hard to see how a man could obtain the broad education requisite to carry out an architect's duties without very wide study, and that could not be better obtained than by seeing the buildings which other countries have put up. But the student should not confine himself to foreign travel as some are apt to do.

Mr. STANLEY HAMP said that Mr. Elkington had done his best to throw dust in their eyes, but the arguments used were weak. The point made in the discussion that a national style was quite unnecessary was a true one. Travel facilities render it most difficult for anyone to produce a national style. It was almost impossible to properly understand buildings from photographs. This was his own experience, most especially in the case of St. Mark's, Venice. A higher ideal was necessary than the evolving of a national style.

Mr. ARTHUR KEEN, the President, concluded the discussion by saying that it did not appear as if Mr. Elkington had found many friends for his motion. It would undoubtedly be a delightful thing if all English architects were speaking the same language and if we were not threatened with being effaced by buildings of other nationalities. The strict logical outcome of Mr. Elkington's argument was that a man should not go outside his native village, for there was as much difference between certain parts of this island as there was between England and Normandy. Architecture is the servant of the State, and must progress as social conditions progress. Things develop more and more rapidly as time goes on, and we have reached a stage where developments must be very rapid and very comprehensive. Everything was in a state of transition. The only hopeful outlook seemed to be towards a time when there shall be an international style, a Parliament of Nations and the Federation of the world. Then there would be people in different parts expressing themselves in the same language.

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Mr. Elkington having replied to the many points raised in the discussion, his motion was put to the meeting, and lost by two votes, the result being 24 votes against the motion, 22 votes in favour.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The Late Mr. Wornum and the R.I.B.A. Examiners in Architecture.

On the motion of Mr. H. P. Burke Downing, the following resolution was passed at a meeting of the Examiners in Architecture held at the Royal Institute of British Architects on Wednesday, December 7:—

"The Examiners in Architecture of the Royal Institute of British Architects desire to express their sense of the great loss sustained by the Institute in the lamentable death of Mr. R. Selden Wornum, to whose work as an examiner for more than twenty years and in the organisation of architectural education the Royal Institute and a succession of generations of students to whose interests he devoted care and time without stint are so deeply indebted. It is with a sense of personal loss that his colleagues lament the death of one who brought to their counsels a wonderful power of insight and sympathy and ripe experience in dealing with the problems presented, and they desire to express their sincere condolences and sympathy with his widow."

Professional Conduct: Council Resolution.

The attention of Members and Licentiates is called to the following resolution passed by the Council at its meeting of November 21, which is to form No. 6 of the Resolutions relating to Professional Conduct (see Kalendar 1910-11, p. 12):—

"Any Member or Licentiate of the Royal Institute who takes part in any competition as to which the Council shall have declared by a resolution published in the Journal of the Royal Institute that Members or Licentiates shall not take part because the conditions are not in accordance with the published regulations of the Royal Institute for Architectural Competitions, shall be deemed to be guilty of unprofessional conduct."

ELTHAM MANOR.*

Eltham, one of our oldest manors, possesses many important associations, chief among them being the ancient Royal Palace, which for many years was the abode of our English kings, and the ruins are still an object of great interest to the admirers of national architecture.

The present parish church is a modern building completed in 1875, but there are records of two previous churches, one of which fell down in 1667 owing to some imprudent excavations, and the restored church, dedicated in honour of St. John the Baptist, consisting of a nave, aisles and chancel, with a western tower and a lofty spire, which was pulled down in 1873 to make room for the present more commodious structure.

Amongst the remarkable persons buried in the old churchyard may be mentioned John Phillipott, Somerset Herald; John Lilbourn, one of the "Grand Republican" characters of the seventeenth century; Thomas Doggett, a noted actor and the founder of Doggett's Coat and Badge; Dr. James Sherard, the celebrated botanist; the learned Dr. Horne, Bishop of Norwich; and latterly that famous sportsman Colonel North.

The first authentic record we have is that the manor of Ealdham, or Alteham, was held under the Crown, in the reign of Edward the Confessor, by Alwold, who paid the King 16*l.* a year for his holding.

Next we find it recorded in Domesday Book that William the Conqueror gave the Manor to his half-brother Odo, Bishop of Bayeux, together with some 200 other manors, as a recompense for his assistance in the invasion of England in 1066, but he was afterwards imprisoned and exiled for his ambitious schemes against the King, and that Haimo, a kinsman, held it under him as Shire Reeve and Lord of Eltham. It may be interesting to note that the Bishop of Bayeux caused the Bayeux tapestry to be made, representing the Battle of Hastings, 214 feet long by 20 inches, and containing 623 persons, 602 horses, dogs, &c., thirty-seven buildings, and forty-one boats, and was made for the cathedral of Bayeux.

Haimo's niece married Roy, Earl of Gloucester, and Eltham Manor was held for over 100 years—i.e. until 1263—by the Earl of Gloucester and his heirs until the death of Richard de Clare.

The period when Eltham Palace was originally built is uncertain, but according to Matthew Paris (the Chronicler of the 13th century) it was built before 1270, as Henry III. kept the festival of Christmas here in great state in that year; this being the first reference to Eltham Palace as a royal dwelling, and it must have been a large building to accommodate King Henry and his suite on a state visit.

The manor was then held by John de Vesci, who, in the twelfth year of the reign of Edward I. procured a charter for holding a weekly market and an annual fair. The Dictionary of National Biography states that "Anthony Bek built the castle of Eltham, and most probably at this date it was a fortified residence with a drawbridge and moat." Leland says that Bishop Bek was either the very author or the first beautifier of this stately and beautiful palace at a great cost. He died March 3, 1310, granting the reversion to the crown, and the palace was for many years after the regular abode of English kings.



GREAT HALL, ELTHAM PALACE, SHOWING TUDOR WINDOWS, HENRY VII.

Edward II.'s youngest son, called "John of Eltham," was born here in 1316, and was buried in Westminster Abbey in 1337, he being the last son of a king of England to die a plain earl (the later ones being dukes).

In the succeeding reign of Edward III., who received a great deal of his education here, several parliaments were held, and King John of France, taken prisoner at the battle of Poictiers, 1356, was splendidly entertained during his four years' captivity in this palace, whence the appellation King John's Palace is supposed to be derived. Froissart, in his chronicles, describes Edward III. and his Queen living at "his magnificent palace at Eltham" when the news of King John's landing was brought to him.



GREAT HALL, ELTHAM PALACE: SOUTH SIDE.

Sir Nicholas Harris Nicholas, in his "History of the Orders of Knighthood," states that there are strong reasons for believing that the Order of the Garter was finally established at the tournament at Eltham in the memorable autumn

* Read at a meeting of the Upper Norwood Athenæum by Messrs. Frederick and Herbert Weise.

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when Edward III. returned from his victories in France, and this tournament actually took place in the tilt-yard of which we have seen part of the boundary wall and old Tudor gateway to-day.

Richard II. was created Prince of Wales at an Eltham parliament mentioned above, and three successive parliaments were held here in his reign (1384-86), and much important business transacted. It was also at this palace that Holinshed says Henry Bolingbroke, Duke of Hereford, took his leave of the King, who there released him four years of his punishment, "so he took his journie over into Calais, and from thence into France, where he remained."

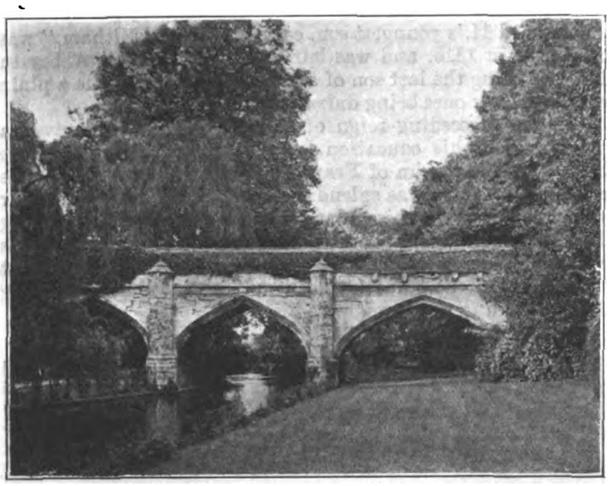
An important visitor in the reign of Richard II. was King Leo of Armenia, who had been driven out of his dominion by the Turks, and was entertained most sumptuously by the king.

In the Controlment Rolls of the 14th year, Richard II. (1391), it states that Geoffrey Chaucer, who was then clerk of the works for various royal palaces, was robbed of £20 on his way to Eltham to pay certain sums. John Richard Green writes that Henry IV. held many councils, and inaugurated that infamous act, The Statute of Heretics, for the suppression of Lollardism here, and the last Christmas of this king's life was passed at his favourite palace at Eltham.

Henry V. passed the first Christmas of his reign at Eltham, and three years later entertained Sigismund, Emperor Elect of Germany and King of Rome, at a cost of £200, a goodly sum in those days. Henry VI. was a baby at Eltham when his father died, which you will find mention of in Shakespeare's play; and in 1438 this king renewed the ancient charter to permit a fair to be held there. Edward IV. lived here a good deal, and in 1489 held a famous tournament. We can also gather some idea as to the size and convenience of the palace from the record that at Christmas, 1482, 2,000 people feasted at the table of the king.

The great hall was erected by Edward IV.; his badge (the rose en soleil) being carved in the spandrels of the hall door, with its beautiful cornice and elegant tracery, and in the ceiling of the south bay leading to the lawn it is mentioned there is another of these badges, the Falcon and Fetterlock.

We also owe to Edward IV. the building of the present beautiful stone bridge over the moat, with its fine ribbed arches intact, which dates 1461-1483, and by the kindness of Mr. Newton Dunn, the present holder of the moat house, we



MOAT BRIDGE, ELTHAM.

are able to view this from his lovely garden and moat. You will also notice when in the moat garden the remains of one of the red brick corner towers of the old palace boundary wall. There is only a small portion of the moat left with water, which is fed from a spring in the Warren golf ground, the remainder being transformed into a beautiful garden of the court, in the possession of Mr. G. D. Wilson.

The palace was greatly improved and added to in the reign of Henry VII., who as Lambarde mentions, set "up a fair front extending full 380 feet over the moat, and beautified the building, some details of which are recorded in the Egerton manuscript, as follows: —

"Expended at Eltham for shifting the oratory of the King, repairs of the bultying house, stove house, bakery lodges, lower court near the last part of the bridge, making a certain new bridge (Pons Hauriabilis), &c., from March to November 15-16 Henry VII. thirty-three weeks and a day, this at a cost, including sand, tyles, glass, &c., 44*l.* 6*s.* 6*d.*"; but none of this handsome work remains, only the great hall of Edward IV. is left standing.

Erasmus visited here with Sir Thomas More, and saw young Henry VIII., then nine years old; describing him as having a right royal bearing showing a nobility of mind in addition to a person of singular beauty. Henry VIII. occasionally resided at Eltham, and kept Christmas here "with balls and feasting in 1527," but being yet more pleased with his new palace at Greenwich, he by degrees entirely neglected this manor, and in a few years it was totally deserted by the Royal family as a residence, and the manor was leased to Sir John Peche, March 20, 1512, for twenty years, at 34*l.* 6*s.* 8*d.* per annum.

Cardinal Wolsey took the oaths of Lord Chancellor here Christmas Eve, 1515, in succession to Archbishop Warham, some ancient buildings being still called "My Lord Chancellor, his lodgings"; these occupy exactly the same site, namely, the south-east corner in the outer green court as shown on the ancient plan of the palace, and contain the original stairs and other portions of early date.

Cardinal Wolsey instituted in 1525 the statutes of Eltham, being a code of rules for the betfer conduct of the King's household, which contains some quaint regulations.

Charles I., in 1629, appears to have been the last monarch to visit Eltham, and for some time the famous painter Vandyck stayed here and painted a few of his earlier pictures.

(To be continued.)

ILLUSTRATIONS.

INTERNATIONAL CORRESPONDENCE SCHOOLS, KINGSWAY, LONDON.

WE regret that owing to incorrect information with which we were supplied we gave the name of Mr. HARRY E. RIDER as the architect of this building with the illustration in last week's issue instead of that of Messrs. GORDON & GUNTON, by whom it was designed, and who were the architects under whom it was erected

HOUSE, FRIAR LANE, LEICESTER.

THIS Georgian house, built in 1750, presents one of those pleasing elevations the details of which are as much worthy of study as the general outline and grouping of the component parts. The system of proportions, for example, adopted in the design of the doorway makes one appreciate the thought that was expended in producing such a happy result, it being distinctly the most interesting one of the many in the immediate locality. The general structure is composed of red bricks, 9¼ inches by 2⅛ inches, English bond, numbering four courses to 9⅜ inches, relieved with stone dressings crowned by wooden and plaster-built cornice, with a roof of the vari-coloured Swithland slates. The doorway, excepting the stone bases, is of wood and plaster, but the windows immediately above are in stone. The exterior of this old house would lead one to anticipate something of an interesting nature in the interior, either in some characteristic staircase or oak-panelled rooms, but nothing of this sort exists, and anything that there is comes decidedly under the category of commonplace. Our illustrations are from measured drawings by Mr. W. STEAD MILLS.

OXFORD COLLEGE SERIES, BALLIOL.—CHAPEL—NEW ADDITION.

WE this week complete our series of views of Balliol College, which was commenced in our issue of November 25.

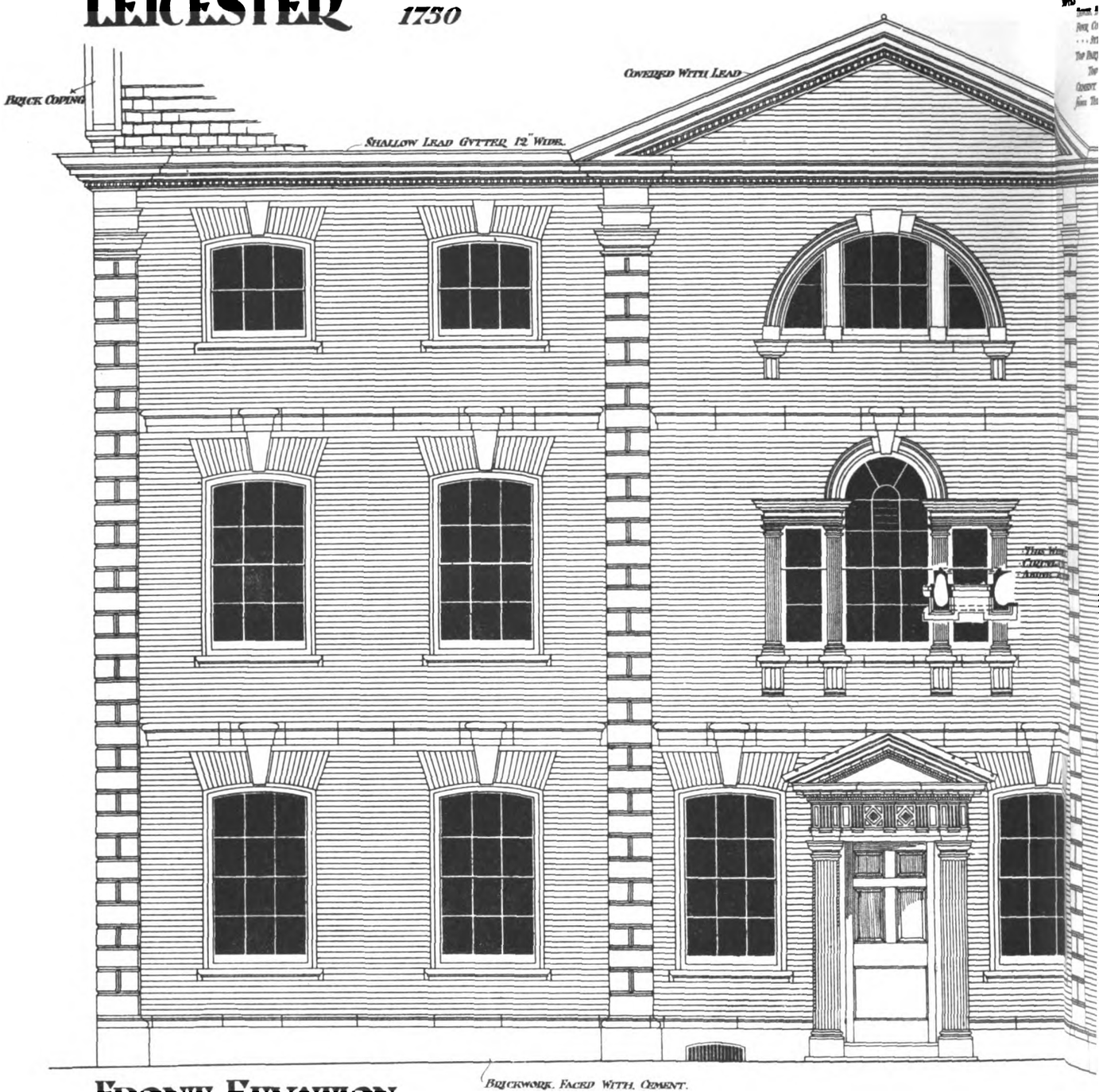
THE first Garden City Company of Canada has been organised, with a capital of $1,000,000, to purchase a large tract of very suitable land, where some hundreds of model dwellings, built with the strictest attention to hygienic rules, and each with its own garden attached, will be erected as soon as the plans are ready.

MR. HENRY JOHN TREADWELL, of 14 Marlborough Place, St. John's Wood, N.W., architect, of the firm of Messrs. Treadwell & Martin, of Charing Cross House, left estate of the gross value of 9,495*l.*, of which the net personalty has been sworn at 3,581*l.*

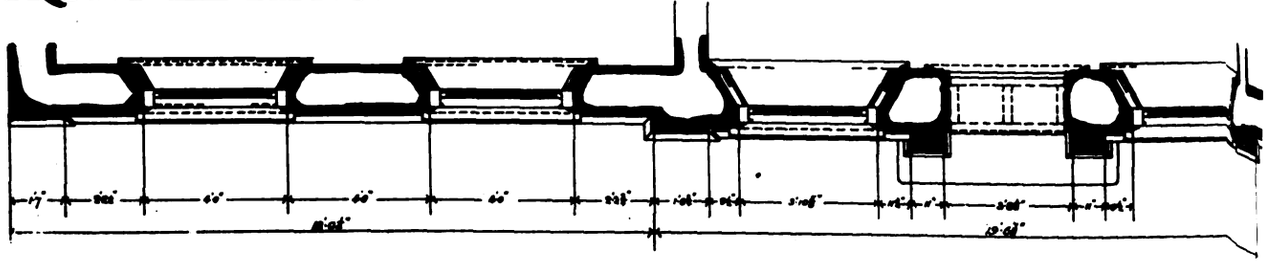
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House: Friar Lane Leicester 1750



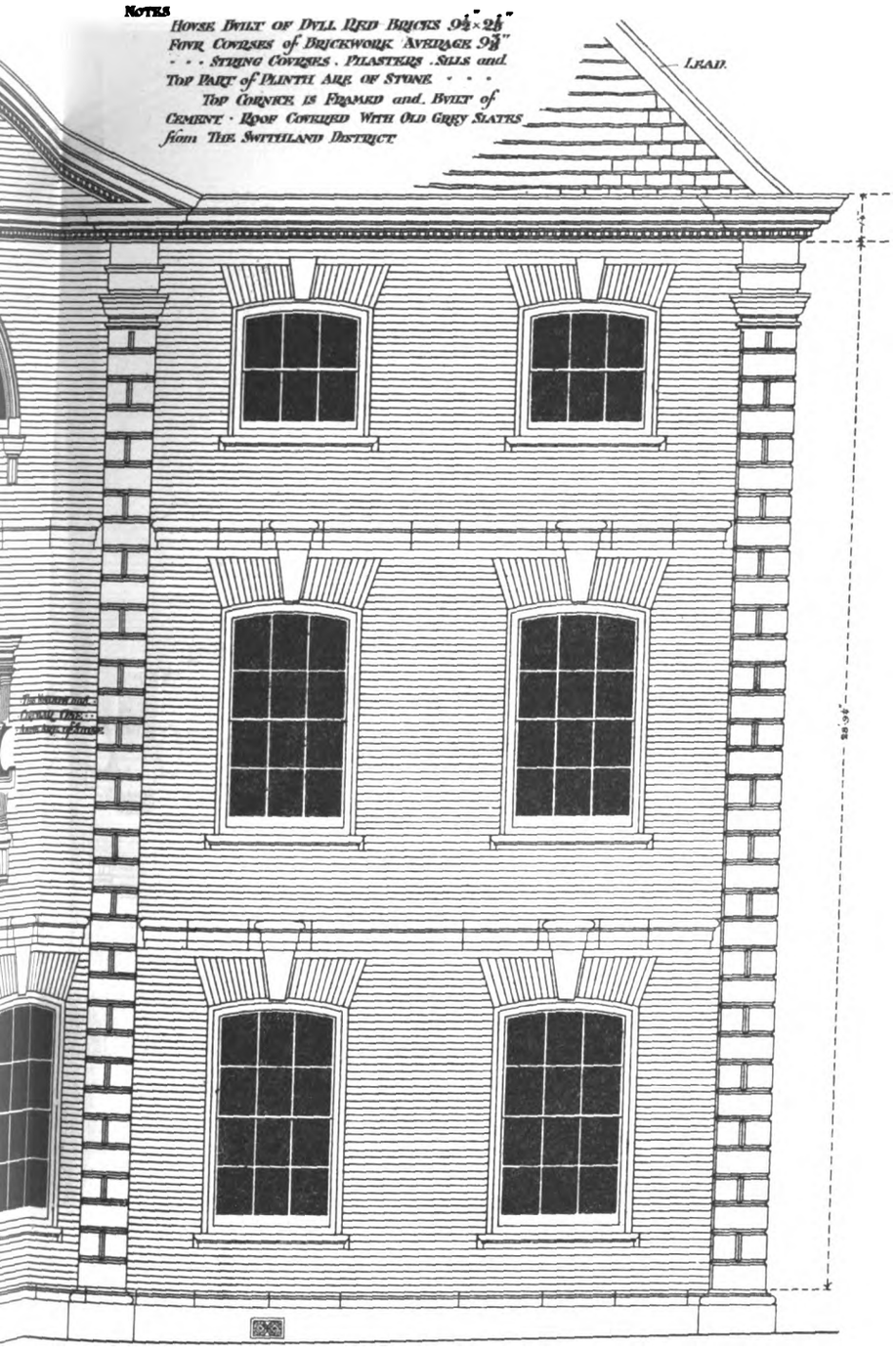
Front Elevation

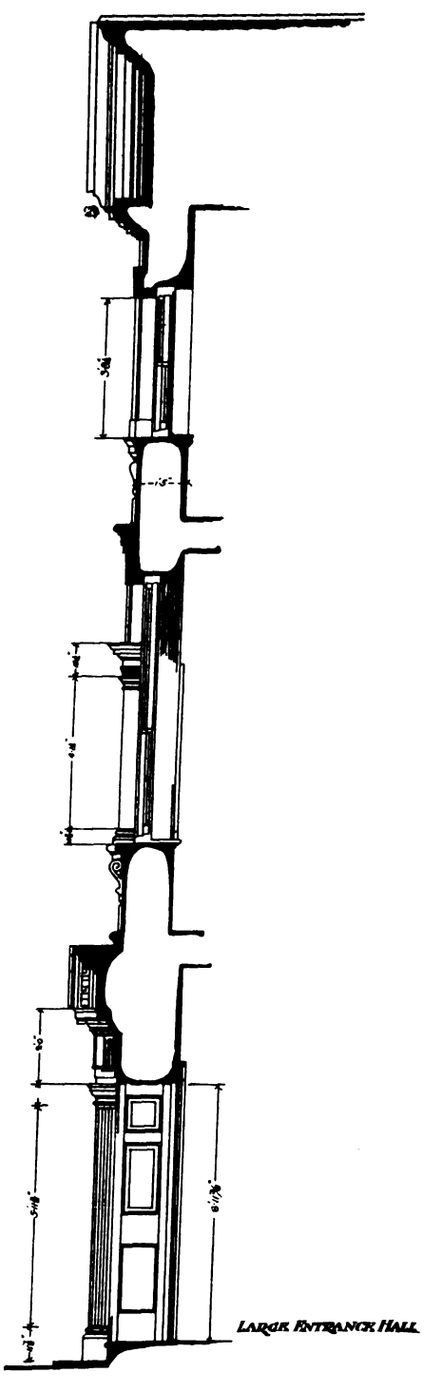


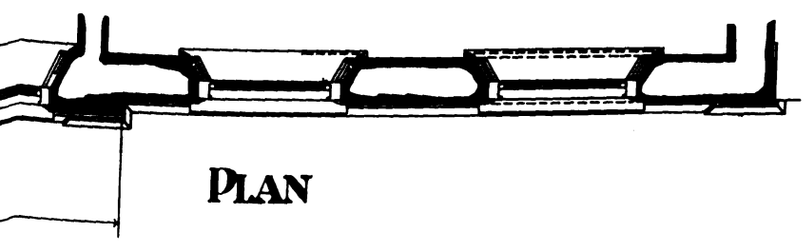
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NOTES

HOUSE BUILT OF DULL RED BRICKS 9½"×2½"
FIVE COURSES of BRICKWORK AVERAGE 9⅜"
· · · STRING COURSES . PILASTERS . SILLS and
TOP PART of PLINTH ARE OF STONE · · ·
TOP CORNICE IS FRAMED and BUILT of
CEMENT · ROOF COVERED WITH OLD GREY SLATES
from THE SWITHLAND DISTRICT







PLAN

SECTION Thro. CENTRE BAY

· MEASURED AND DRAWN ·
· BY WILLIAM S. MILLS. 1905.

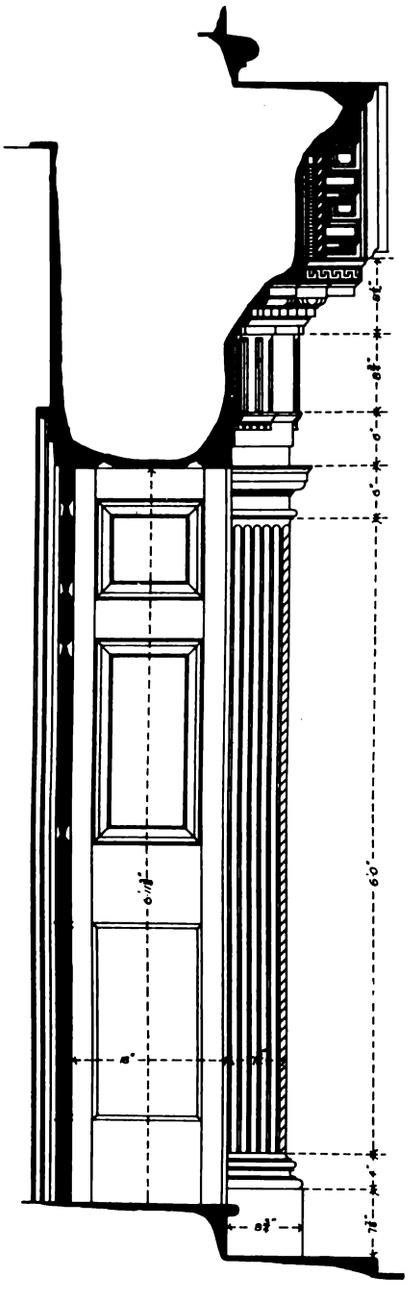
PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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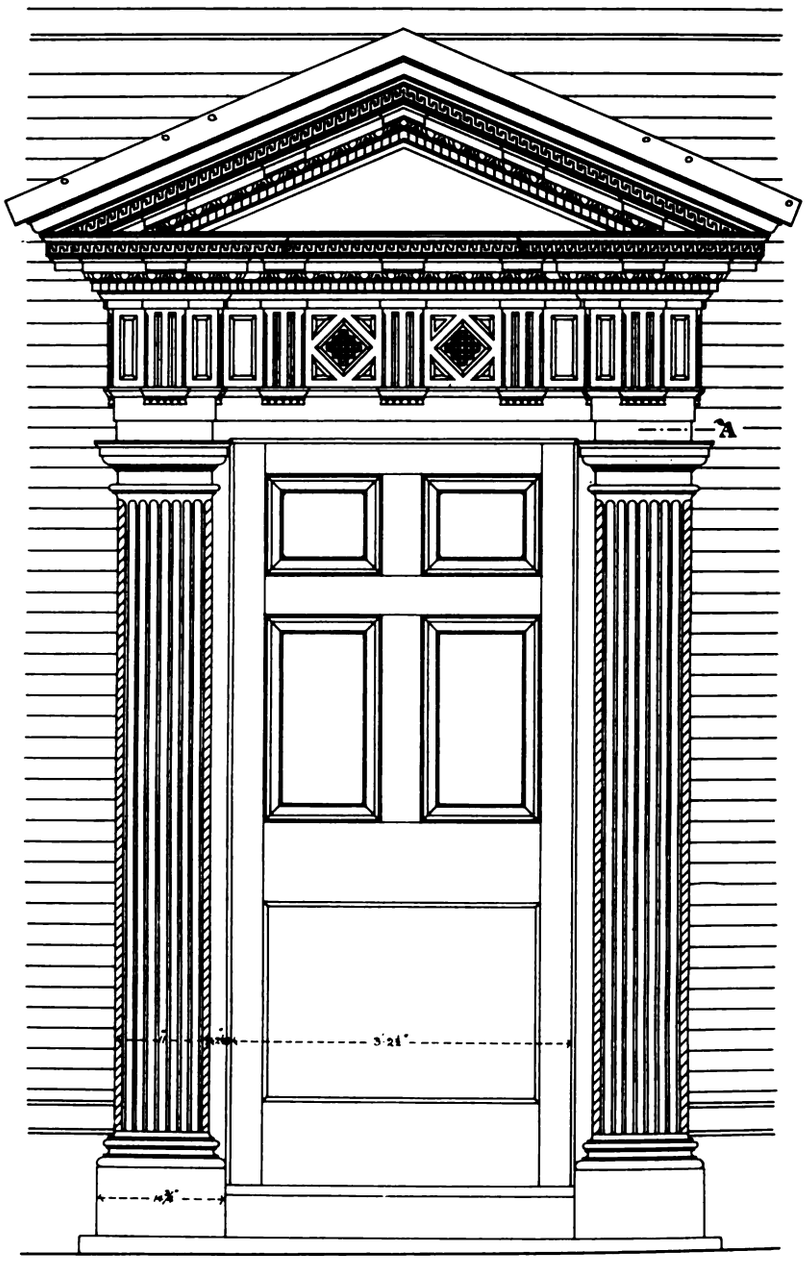
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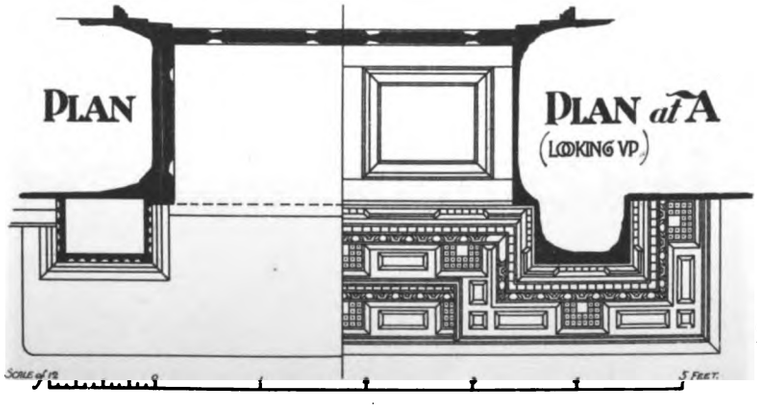
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SECTION



ELEVATION



DETAILS of DOORWAY

PILASTER G

STONE BASE

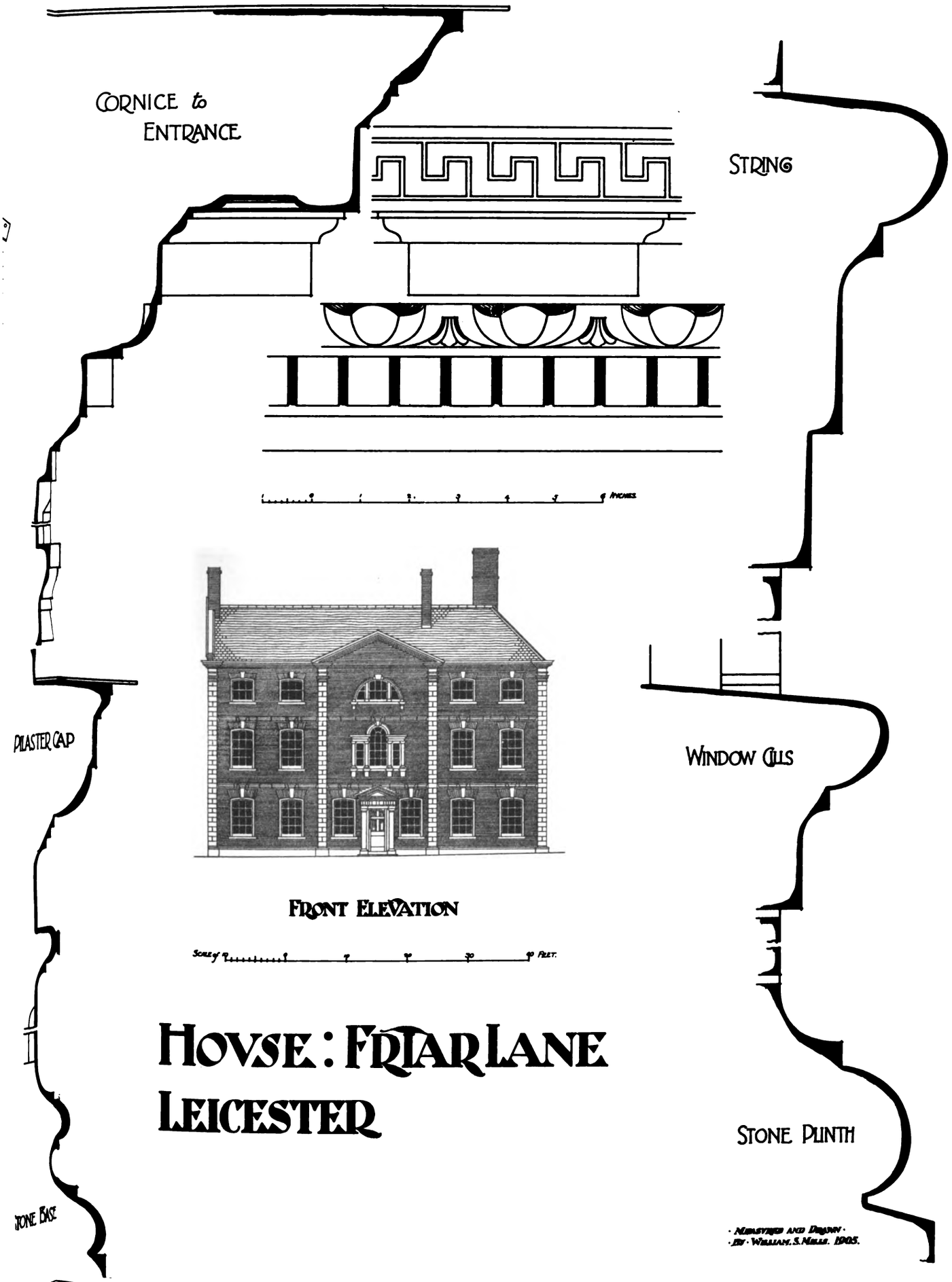
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Architect Dec: 16th 1910.

FRONT ELEVATION

SCALE OF FEET.

HOUSE: FRIAR LANE LEICESTER



MEASURED AND DRAWN BY WILLIAM S. MILLS. 1905.

PHOTO-LITHO. SPRAGUE & C° L. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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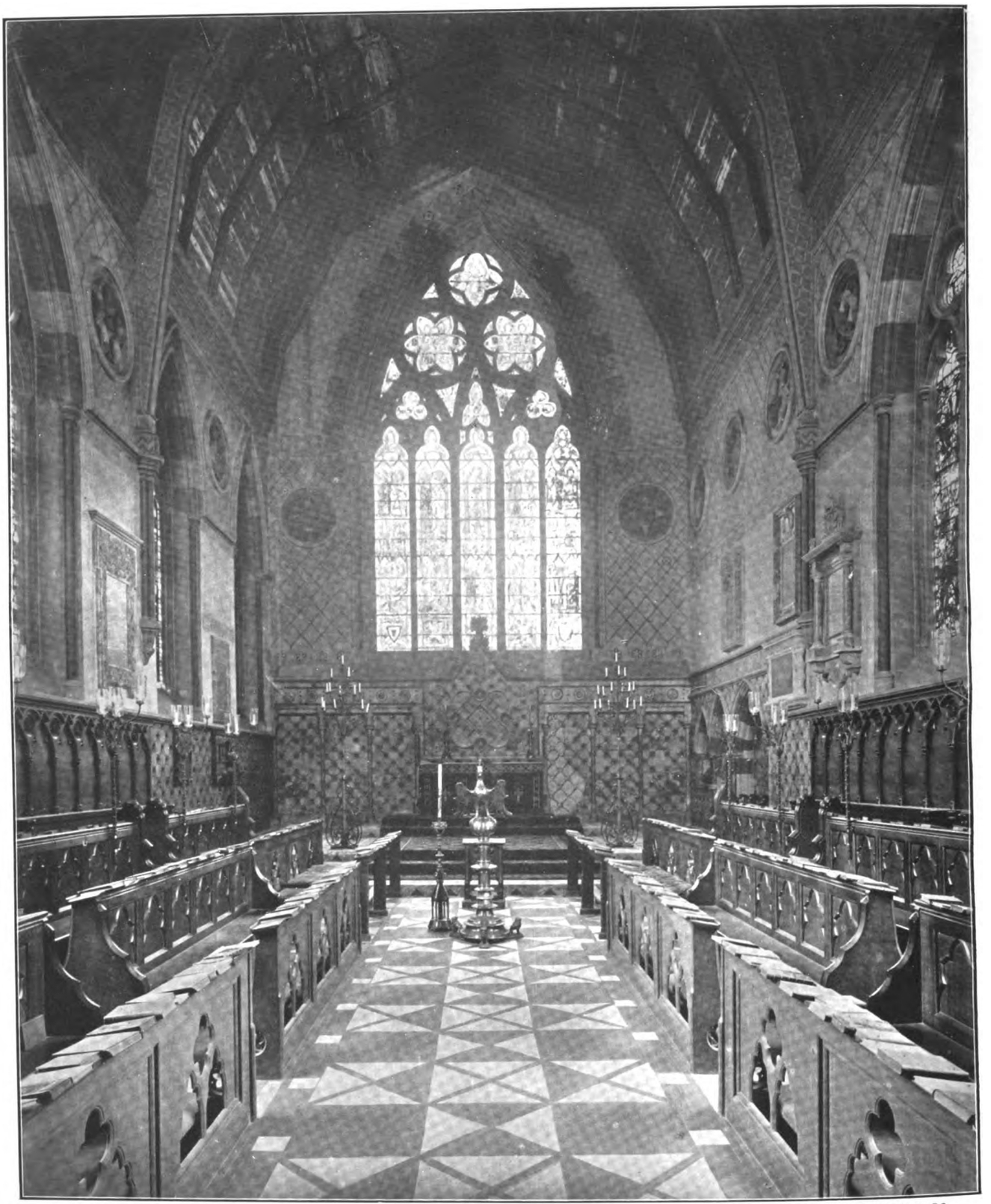


Photo by A. E. WALSHAM, 60 Doughty Street, W.C.

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OXFORD COLLEGE SERIES. No 99.—BALLIOL: CHAPEL.

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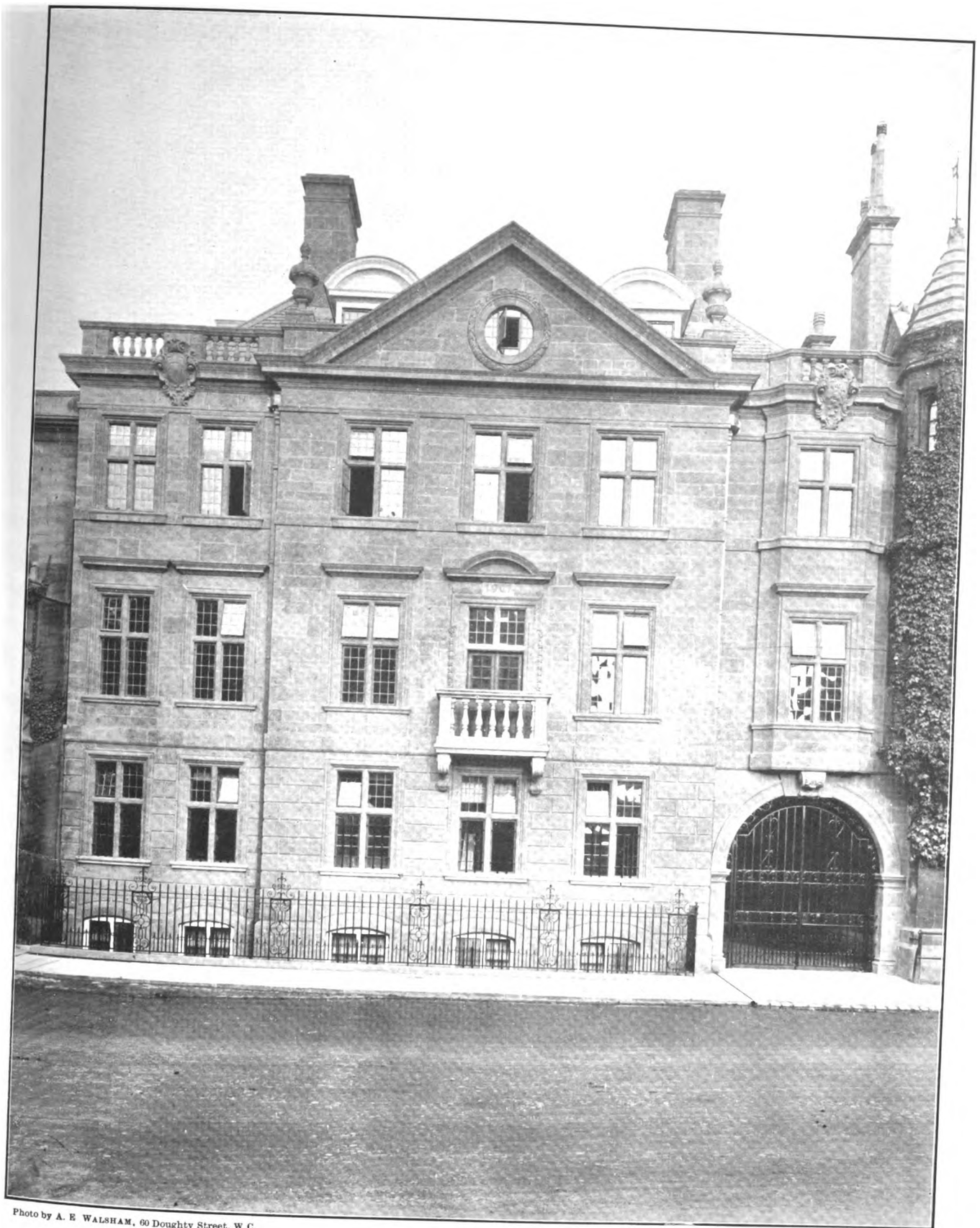


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OXFORD COLLEGE SERIES No. 100.—BALLIOL: NEW ADDITION.

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PETROL AIR-GAS.
THEORY AND PRACTICE OF THE NEW ILLUMINANT.

By Professor C. A. M. SMITH, M.Sc.

(*Continued from page* 362.)

The "Premier" Air-gas Plant.

THE machine is of the "weight-driven" type—*i.e.* the motive power is obtained by means of a weight, which is allowed to fall slowly, and, by means of an attached string passing over an arrangement of pulleys, rotates

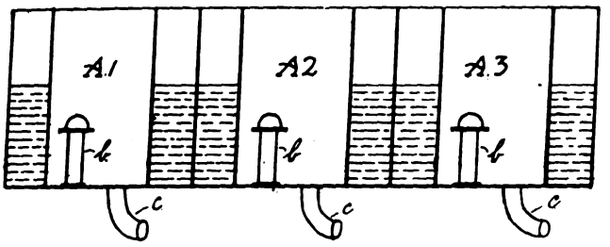


FIG 14.

the drum of the machine. The plant is designed on novel lines. The machine is made up of a rectangular tank with inner tanks and divisions, air-collectors and delivering arrangements, a gasholder, carburettor, petrol tank and pump. The rectangular tank *a* is divided into three, four, or more compartments, within each of which is an inner tank, the inner and outer divisions being sealed from each other with water (see diagram fig. 14, showing a longitudinal sectional elevation).

In each inner tank, A1, A2, A3, is an inlet valve, *b*, *b*, *b*, and an outlet pipe, *c*, *c*, *c*, the inlet valve being a balanced mercury seal valve.

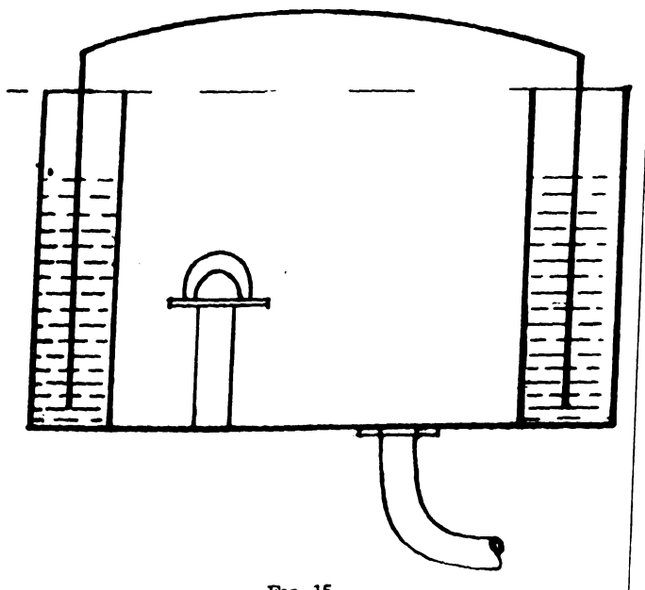


FIG. 15.

From fig. 15 it will be seen that each division is provided with an air bell or collector which fits in the spaces containing the water-seals.

Each air-collector has a chain wheel on the top, as indicated in fig. 16. As will be seen from fig. 17, a main shaft is arranged with a number of chain wheels, one corresponding to and holding up each air-bell, fixed eccentrically.

These wheels, E, E_1, E_2, are so arranged that as nearly as possible the air-bells shall balance each other.

The shaft, working in ball bearings (*f*, *f*), has keyed to it a toothed wheel (*g*) which gears with a larger toothed wheel (*h*), the latter working loose on the shaft of the drum *i*. At the end of the drum *i* is a fixed ratchet, and on the wheel *h* is a pawl.

A wire cable passes round the drum from the pulleys mentioned above. When the weight has been fully raised and the winding handle is disengaged, the pull of the weights is exerted on the drum, causing it slowly to rotate. The ratchet wheel then engages with the pawl,

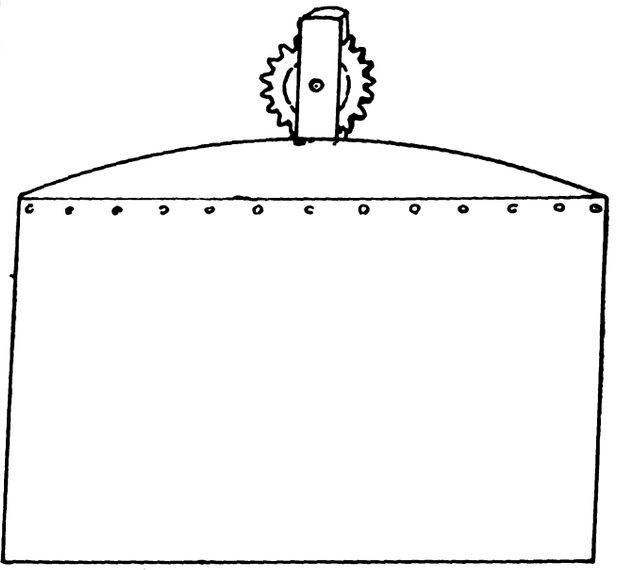


FIG. 16.

rotating the spur wheel *h*, which causes the shaft *d* to rotate, lifting and depressing the air-bells in succession by means of their eccentric chain arrangements. As

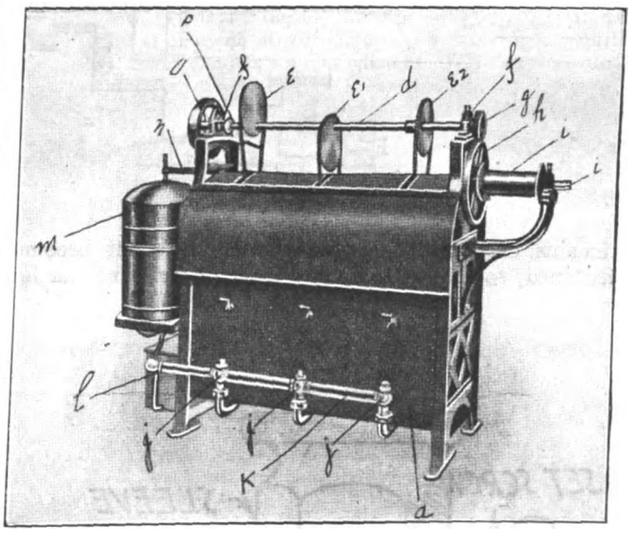


FIG. 17.

any one bell rises it draws in air through the mercury valve *b* (fig. 14). On its return it seals this valve and forces the air out by the valve *c* (fig. 14), through the bulb *j* (fig. 17), along the pipe *k* to the carburettor *l*. After leaving the carburettor the gas passes into the gasholder *m*, and when the latter is full it has risen far enough to lift the lever *n* and engage the brake on wheel *o*, and stops the machine. As soon as the gas is used and the holder falls the lever *n* also falls, releases the brake, and allows the machine to rotate again.

On the reverse side of the machine (fig. 17) is a petrol pump (fig. 18), whose plunger is worked, as shown in fig. 19, by means of a rocking lever, whose end is depressed and then allowed sharply to return as each tooth of the cam *p* passes it, *p* being keyed to the main shaft *d*. Thus for a revolution of the shaft the pump delivers a definite amount of petrol to the carburettor. The quantity discharged by the pump is regulated by a sleeve regulator on the pump rod (fig. 19), which, by turning, either raises or depresses the end of the rocking lever, so altering the volume discharged; this regulator, once set, rarely needs altering.

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The carburettor (fig. 20) is semicircular, or may be of any other convenient form. The air enters from the air-pipe *k* (fig. 17), and the passage, as it descends the carburettor,

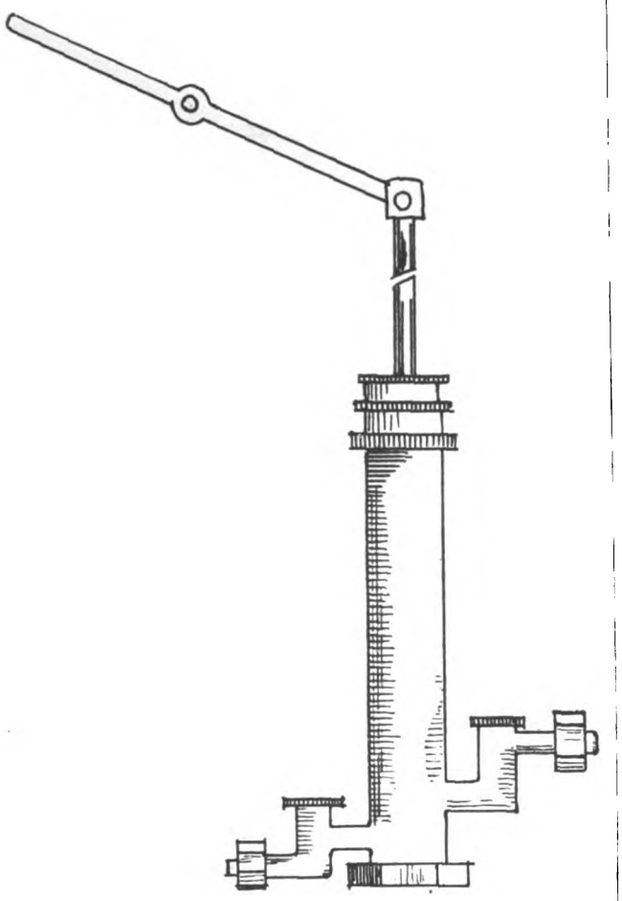


Fig. 18.

remains of constant cross-sectional area, but becomes flattened, so that at the end a layer of air $\frac{1}{8}$ inch or less

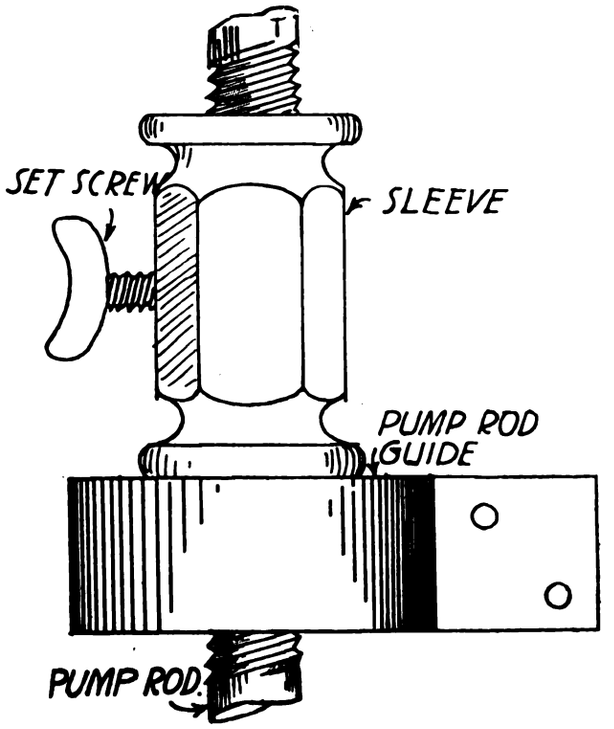


Fig. 19.

in thickness is exposed to the petrol, which is discharged into the lower part of the carburettor by the pipe *a*, (fig. 20), and is disseminated by means of gauze. At the lowest point of the carburettor is a trough, *b*, communicating with the interior by a slit $\frac{1}{32}$ inch wide, to collect any condensed water which may accumulate. This

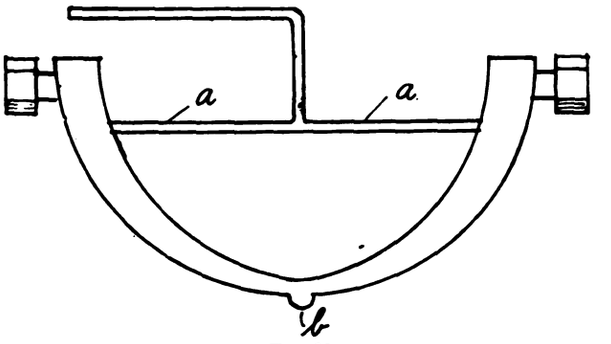


Fig. 20.

water is drawn off every twenty-four hours by a drain cock, or a small vessel (fig. 21) is attached to collect the moisture.

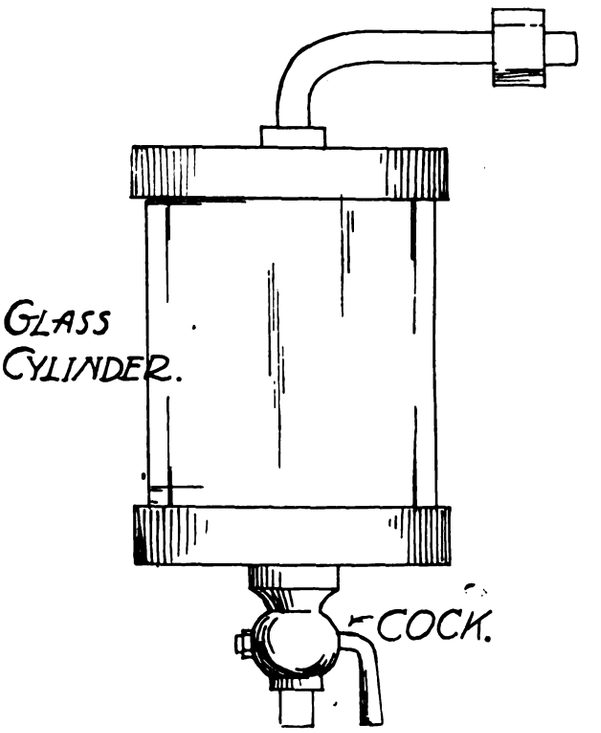


Fig. 21.

As will be seen from fig. 22, the carburettor lies in a rectangular vessel containing water. A copper tube, *b*, passes through the vessel and contains a small Bunsen burner (for cold weather); the ends of the tube being closed with gauze, it acts on the principle of the Davy lamp, preventing any possibility of danger from petrol fumes. The Bunsen jet is automatically governed to limit the temperature of the water to 65° F.

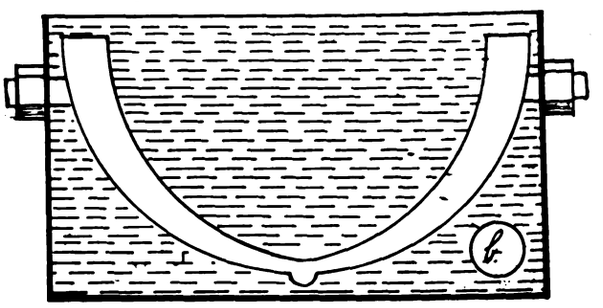
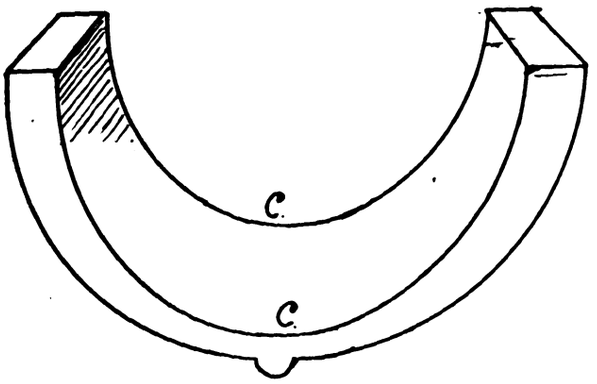


Fig. 22.

This carburettor with 0.68 Swan spirit (petrol) is found to vaporise the whole, no moisture being observed if the drain cock is left open.

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Fig. 23 shows the carburettor in perspective. Assuming area of air-pipe equals .7854 (1-inch pipe), the air-space from *c* to *c* (fig. 23) will also be .7854, and, the thickness being reduced to $\frac{1}{8}$ inch, the width is about $6\frac{1}{4}$ inches.



CARBURETTER IN PERSPECTIVE.

FIG. 23.

By forming a thin layer of air this carburettor presens a relatively large area of surface, which extracts the moisture from the warm incoming stream. Each charge of petrol in evaporating cools the surface of the carburettor, which then renews its heat from the surrounding water-jacket before the next charge is evaporated.

The advantages claimed for the plant may be summed up as follows:—(*a*) Any desired pressure may be obtained, from 1 inch to 4 inches, or even more; (*b*) when making gas the machine supplies air at a uniform pressure in a strictly constant proportion to the petrol, whether working on full or light load; (*c*) since the petrol pump is worked off the same shaft as the air-supply, whatever the speed of delivery required the deliveries of air-petrol are synchronous; (*d*) the water-heating arrangement round the carburettor prevents the possibility of freezing up due to liberated moisture from the air in cold weather; (*e*) no chemicals are used for extracting the moisture from the air; (*f*) there is no surplus spirit present in the carburettor to enrich the mixture unduly when only a very small supply is demanded; (*g*) the machine may be opened for inspection by the removal of four bolts only, it is simple in construction, and has no delicate exposed parts.

Simpetrol Lighting System.

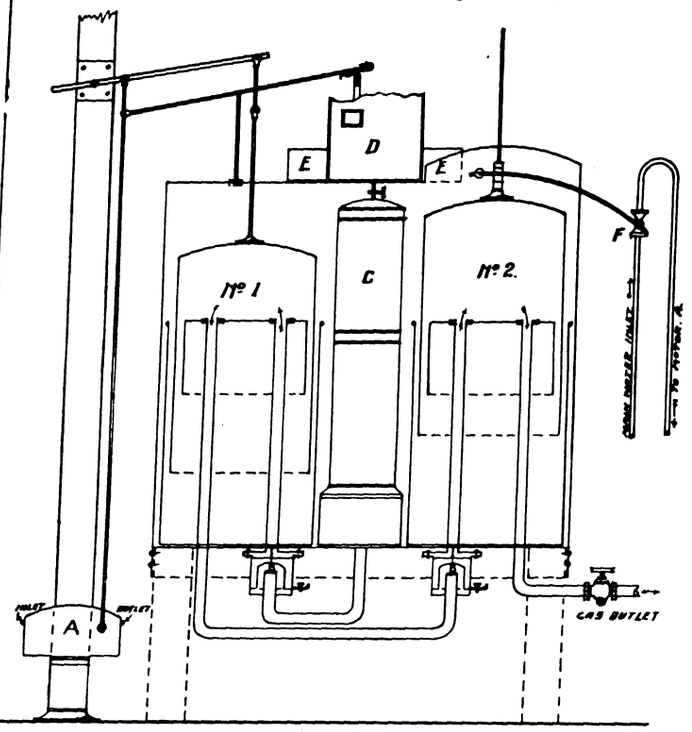
This plant is very simple and compact, being all mounted on one table. A small hot-air engine drives, by means of a belt, a rotary blower which sucks in air from the atmosphere, solid impurities being removed by a gauze screen placed over the mouth of the air inlet. The air is delivered up a tube into a small gasometer, whose pressure may be regulated by dead-weights placed on top. The pressure in this receiver forces the air down a second pipe into the carburettor, where it is mixed with petrol vapour, a considerable quantity of petrol spirit being always kept in the bottom. The proper mixture is adjusted by raising or lowering the air distributor in the petrol, and is indicated by the colour and shape of a naked Bunsen flame burning off the main, finer adjustment being made on a "pilot" mantle. From the carburettor the gas goes straight to the mains.

The air-engine is heated by a jet of the gas manufactured. To start up, the engine is given a few turns by hand till a steady flame is obtained.

By adding a gasometer a supply of gas may be stored when the engine is not running, and the addition of a special pneumatic switch allows the light to be put on and off like electric light.

The Mercury Plant.

The chief point about this plant is the absence of valves. This seems to be an advantage, as any valve

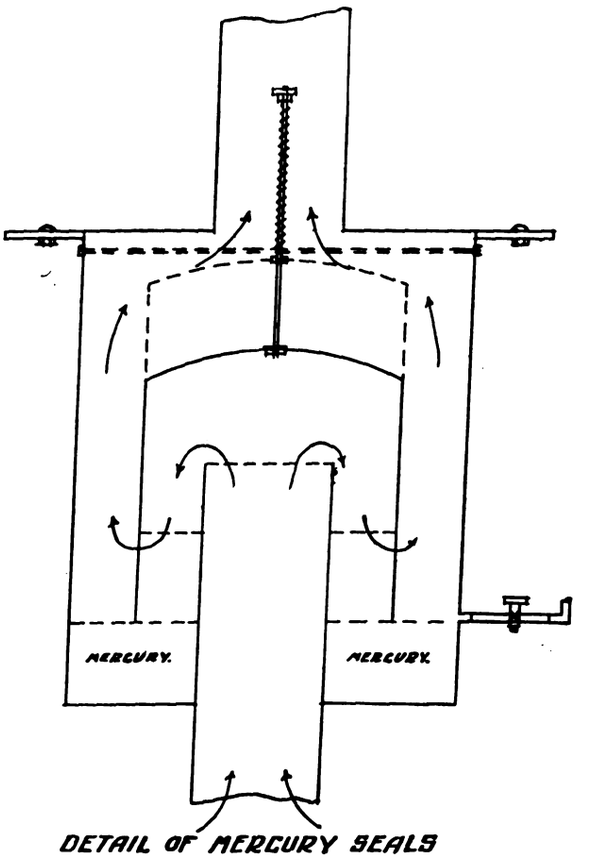


SECTION OF MERCURY AIR GAS PLANT

TANK No 1. ACTS AS PUMP No 2. GAS HOLDER
A. WATER MOTOR. D. PETROL LIFTING BOX.
B. MERCURY SEAL. E. " STORAGE TANK
C. CARBURETTOR. F. WATER-REGULATING-LEVER-COCK.

FIG. 24.

leakage will certainly affect the proportion of air and gas, and this will cause a varying light or frequent adjust-



DETAIL OF MERCURY SEALS

FIG. 25.

ment. The inventor of this plant has arranged that the petrol in the tank is constantly mixed.

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Heat is not used to vaporise the petrol. The carburettor consists of plates in a spiral form, and should ensure a good mixture.

An advantage is that the plant is automatic. Turning on of one light starts the plant; turning out the last light entirely stops it.

Motive power is supplied by a small water motor. The makers say that with a pressure of 40 lbs. the consumption of water is forty hours for burning one light.

Cox's Air-gas Plant.

This plant is self-contained, the gas generated being drawn upon for the energy to drive the engine.

Air is drawn from the atmosphere by a blower driven from a hot-air engine, the latter being warmed by a jet of the petrol air-gas generated. The air is carburetted with petrol, and the makers claim that the theoretically perfect mixture is obtained, namely, 98.6 per cent. of air to 1.4 per cent. of petrol. The gas is said to be quite clean, leaving no fur in the piping, and tests by the makers have proved that there is no condensation of water in the pipes. An advantage claimed for the system is that petrol as heavy as .720 density can be used with complete success. The best medium for the gas as an illuminant is the Welsbach burner and mantle. Cox's gas can be used for heating with the Welsbach kern radiator and for cooking, the fact that the gas is odourless being in this connection a great advantage.

The "Erin" Plant.

This is made in Dublin, and is the invention of the Rev. W. O'Leary, a Professor of Science in the Mungret College, Limerick. The apparatus is somewhat unique, inasmuch as one of the two holders is operated by a hydraulic piston. This causes a bell to rise and draw in a charge of air, which is expelled into the second holder. This second holder contains the carburettor, and from the second holder the carburetted air (or petrol air-gas) is taken to the burners. The action of the bells is automatic. The consumption of the water which is used in operating the hydraulic piston and the petrol supply is simply dependent upon the demand for the gas.

There is an automatic valve for admitting water to the piston when the bell has fallen, and when the bell has risen the water is automatically cut off. It seems to be fairly easy to adjust the supply of petrol so as to get the gas of various qualities. Of course, this may be convenient for laboratory work, but the householder should never interfere with the plant once it is set by the makers. An advantage of the apparatus is that it is self-starting; there is no trouble with mechanism, and the gas is always available. It should be mentioned that where water is not available weights can be used for operating the apparatus. It should be of service in Ireland in country villages and houses, and, so far as the writer is aware, is the only plant made in the Emerald Isle, where there is now a preference for home manufactures.

(*To be concluded in our issue of December* 30.)

ENGLISH DOMESTIC WORK.—VII.

THE seventh of the course of illustrated lectures on the above subject by Mr. J. A. Gotch, F.S.A., F.R.I.B.A., was given at University College, Gower Street, W.C., on December 8. It dealt with

Inigo Jones and His Successors.

During the seventeenth century a very significant change took place, said Mr. Gotch, in architectural design. All through the mediæval period it seems to have been impersonal, the result of a number of men working together, each concerned with the portion affecting his particular trade. It is probable that some one individual controlled the general scheme, but not in such a sense as to have been entitled to be called the "architect," as we understand the term. His influence to-day is much wider and much more intimate than it was in the Middle Ages.

The term "architect" occurs very rarely previous to the seventeenth century either in literature or in documents. Shakespeare uses the word once; in contracts of Elizabeth's time it appears seldom, if ever, although the documents refer to the provision of design as well as of workmanship. In the numerous books published for the guidance of designers in building matters during the reigns of Elizabeth and James it occurs now and then; but these books were addressed primarily to artificers, and only incidentally to the few who called themselves architects.

The publication of these books is itself a sign of the change which was coming over the methods of design. Hitherto design had been a matter of tradition preserved by guilds, handed down from father to son or from master to man. The horizon of a mediæval workman was limited: he neither knew nor cared much for what was being done in distant lands. His style was influenced by local considerations, and although he conformed to the general changes which affected the whole of Gothic architecture, there was generally a local flavour about his work. The difference in character between the work in Norfolk, Northamptonshire, and Somerset is obvious at first sight; but a closer scrutiny will often reveal variations in those districts themselves. Why were these books published, asked Mr. Gotch, and what kind of architectural style did they illustrate? Did they bring before the eye of the designer masterpieces of Gothic architecture or details of Gothic work? Not at all; no book illustrating Gothic architecture was ever published till the end of the eighteenth century. There was, in truth, no need for such a book; the mediæval workmen had their own traditional knowledge, and it concerned them not at all to learn how the workmen in Germany or Southern France or Spain differed in their ways from themselves. Nor did they think of themselves as being concerned with architecture: they merely built in the manner of their fathers.

Although the mid-sixteenth-century craftsmen shared their predecessors' apathy in respect of what was being done abroad, it was otherwise with those for whom they worked—the great men who were building fine houses all over the land. To these had come new ideas in relation to their buildings. They had heard of the splendid work that had for years been executed in Italy; some of them had seen it; monarchs and wealthy nobles had even brought foreign craftsmen over to exercise their skill in the northern parts of Europe. The Italian manner was a novelty in this land of Gothic traditions. But the new influence caught on, and employers demanded the novel detail in their houses. The foreign artists were not numerous, and so the English workmen had to supply the best imitation they could contrive on a scanty training. Here came the opportunity for the bookmakers. They showed the way in which Italian buildings were designed; they illustrated the "Orders" which gave these buildings their distinctive character; they showed how Classic detail might be applied or perverted to meet the exigencies of buildings which had a Gothic parentage. The books therefore were published in order to help designers who aimed at working in the new Classic style.

The effect, of course, was to foster that style at the expense of the native Gothic. It is true that books were not widely distributed; there was not in those days the rapid dissemination of ideas that there is in our own. But if anyone wanted a book about building he could only find such as dealt with Classic architecture. Hence, in a short time the operations which had hitherto been thought of as building began to be thought of as architecture, and the only architecture that was formulated was Classic architecture. Thus it came about that in the course of half a century people of culture regarded all Gothic buildings as barbarous, and not worthy the name of architecture, the "Gothic order," as it was called, being merely a fantastic and licentious manner of building.

It was only a small proportion of the actual workmen who were able to study books; the rest picked up the new manner from such foreigners as they met, from work which they saw as they went about, and occasionally, perhaps, from verbal description. Some worked all their lives on the old lines. One result of the difficulty of imbuing the workmen with the requisite knowledge was that some of the men whose duty it was to overlook buildings—the surveyors—made a point of studying the new style either through books or by foreign travel. They gradually became more and more responsible for design in the various branches of the building trades, and thus grew to be architects as well as surveyors. The inevitable tendency was for architectural design to become more personal, and for its results to become less like a spontaneous growth of the land.

The number of architectural books published was not in reality very great; they were mostly of foreign production,

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and probably few copies found their way into England. The earliest was printed in Italy during the closing years of the fifteenth century. By the middle of the sixteenth there were perhaps half a score in existence, some in Italian, some in French. These were obviously of no use to unlettered workmen; they were, however, appreciated by men of learning, and were studied by some of the surveyors of the time. One or two Englishmen had produced treatises on architecture by the end of the century; but their direct effect on English design can hardly be traced. It is, indeed, unwise to look to any of the books of the time for direct and immediate influence; their effect seems to have been gradual. As may be supposed, it would be the illustrations which would have the greatest weight, for they would be intelligible to men unacquainted with the language of the text. The more important treatises confined themselves largely to drawings of the orders; but a few of the smaller books, published by the Germans and the Dutch, gave many illustrations of particular features, such as doorways, windows, and so forth, and these appear to have appealed more powerfully to English workmen and to have influenced in some degree the appearance which they imparted to their details.

In another and different direction some of the French books would seem to have had an interesting effect. Philibert de l'Orme and Androult du Cerceau had published remarkably fine illustrations of the more important new buildings in France. It is certain that John Thorpe, who was the most accomplished and ingenious of the English surveyors of the time, had studied du Cerceau's books, and it is quite conceivable that he may himself have contemplated a similar production for England, and that to this idea is owing the collection of his drawings now preserved at the Soane Museum. But, however that may be, it is clear that some of the men who were concerned with the design of large houses thought it worth while to preserve their drawings.

The leader of the new army was Inigo Jones, who had travelled in Italy for the express purpose of studying its architecture. He seems to have thought that if the new style was worth imitating it was worth doing well. Or rather, perhaps, one ought to say that he acquired new ideas upon the subject of architectural design, and having saturated himself with the Classic spirit, devoted himself entirely to that style. He certainly was not a mere imitator; he was sufficiently touched with the ancient fire to make all his work highly original; it was consistent in treatment, and he eschewed all distinctly Gothic forms. It was not so with the many obscure designers who had not had his opportunities. They were all more or less subject to the prevailing fashion, but their work shows a considerable admixture of the old-fashioned detail. In some remote places, indeed, and in buildings of no great importance, the style that had established itself at the beginning of the seventeenth century lingered on until its end. Inigo Jones went to Italy on two occasions, once at the end of the fifteenth century, when he was about twenty-five years old, and again in 1613, when he was forty. In the meantime he had been largely employed in designing the setting and scenery of the masques in which the Court of James delighted. During his second visit, which lasted some eighteen months, he studied the buildings of Italy with much care, and there is a volume of Palladio in the library of Worcester College, Oxford, which is full of his notes, written on the margins. He returned to England in 1615 fully equipped for architectural design, and almost at once obtained employment in high quarters.

John Webb, Jones's son-in-law and pupil, did much charming work, in which there was a considerable play of fancy and a piquant handling of Classic detail. Indeed, it is open to speculation whether Jones's reputation is not in some respects indebted to him. The next great figure is Christopher Wren, that most remarkable man, who was a great scientist before he became an architect.

The houses built by these men differed considerably from those built in the mediæval times, and even from those in the first quarter of the seventeenth century. The magnificence of Elizabeth's days was tinged with homeliness. The magnificence of Queen Anne's time was much more haughty and exclusive. Domestic architecture reflected this feeling.

"THE History of Architecture on the Comparative Method," by Mr. Banister Fletcher, published by Mr. B. T. Batsford, 94 High Holborn, has just been translated into Russian and published in St. Petersburg. It is doubtful whether any other English architectural text-book has received a similar honour.

MANCHESTER SOCIETY OF ARCHITECTS.

ON Wednesday, December 7, before a very large attendance of members, Mr. Raymond Unwin gave a lecture on "The City Development Plan." He first traced the development of the planning of cities from mediæval times. The emergence of the formal type of plan was shown by three slides of plans of Paris, the first the seventeenth-century city, the second, dated 1735, prior to the Revolution, and the third a post-Revolution plan dated 1842. He showed how the plans of the parks outside the early city became embodied in the street lines as the city extended, and resulted in the formation of focal points with connecting vistas.

The early German plan of Mannheim led on to later German suburban planning, which so often missed perfection, and which was lacking in the imagination of French work. The movement in Germany led by Camillo Sitte was based on a careful study of the customs of the land, and was characterised by the closing of the vistas leading from the squares by buildings after the mediæval manner, and a careful treatment of the junctions of roads. American cities were often laid out in strictly formal lines, regardless of the contours of the land and of the important consideration of diagonal access from point to point, with the result that when diagonal roads were laid out across the rectangular plans awkward corner sites were inevitable. Even in American plans of to-day the framework of main roads was filled in with a network of rectangular lines spreading over the whole plan, instead of each area being treated by itself, with its minor roads in proper relation to the framework. The Gothenburg plan was instanced as a fine example of a plan in which the framework had been dictated by the contours of the land, and in which a splendid formal effect had been obtained. The different characteristics of straight or curved streets were next treated. The horizontal or vertical lines of the sides of a straight street changed in emphasis as they receded from the foreground to the distance, whereas in a curved street, such as Regent Street, the buildings further down the concave side of the street were often more nearly in front elevation than were the nearer ones. As the opposite was the case with the convex side, Mr. Unwin argued that it should be treated in a different way from the concave side, and criticised the Regent Street design as failing in this respect.

Mr. Unwin dealt very exhaustively with the principles of modern suburban planning, and treated of the direction of roads which should in the main run north and south. When the roads were east and west it involved planning the houses with north and south frontages. The living-rooms had then to be placed all on the south side, giving too wide a frontage, and resulting in very awkwardly planned houses. The treatment of angles, the ends of vistas, the breaking up of frontages, were finely illustrated by photographs and drawings on the screen, and the study of the plans, such as Versailles, was suggested as being fruitful of ideas for the lay-out of the squares and open spaces of suburbs.

A vote of thanks was proposed by Mr. Lodge and seconded by Mr. Phil Parker, and an interesting discussion followed, in which the President (Mr. P. S. Worthington), Mr. Paterson, and Mr. Hindle took part.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

AT the meeting held on Thursday, December 8, when Mr. Sydney D. Kitson, F.R.I.B.A. (President), occupied the chair, Mr. Mowbray A. Green, F.R.I.B.A. (late President of the Bristol Society), read a paper on the Architecture of Bath.

The great building era of the eighteenth century in Bath was, said Mr. Green, directly attributable to the renewed interest taken by physicians in the healing waters; within fifty years of the opening of the century Bath had risen from a quaint remnant of mediævalism to a fashionable and flourishing health resort, almost the whole of the charming Elizabethan and Jacobean work having disappeared and the later Renaissance taken full possession.

In addition to changes within the city, extensive schemes of development were effected in many directions beyond the walls, so that by the end of the eighteenth century the older portion of Bath formed but a small centre of the new.

Prominent among those concerned with the making of Classic Bath was John Wood, a Yorkshireman, who, when but twenty-five years of age, commenced the building of the Queen Square scheme, just beyond the north-west boundary, one of the first of many noble groups of palatial dwellings

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by which he was to enrich the city, among them being the Grand Parade and Royal Forum, now the North and South Parades, the Circus and the Crescent.

Outside of Bath, Wood's chief work was the magnificent house at Prior Park, built for his patron, Ralph Allen, for the purpose, it is interesting to note, of advertising the local stone; conceived in a fine scale, it was in perfect harmony with its surroundings, and its position on a rising slope was enhanced by the fine sweeping stairs added in 1830-6 by H. E. Goodridge, M.R.I.B.A.

Wood died in 1754. He had been a busy man, commercially successful and not forgetful of his own interests, but leaving behind such a record of buildings as few could boast.

Twenty-seven years before he had found Bath emerging from the squalor of a mediæval city, and far from being what it should have been as an important watering-place, and during this period he had seen erected some of the most palatial groups of dwelling-houses in any city in the kingdom.

His schemes were laid out with a sense of nobleness and fine effect, adjusting every part to the whole and the whole to the surroundings, surroundings which had to be considered both in relation to their present aspect and their future development. Masterly and bold in design, he grouped up the façades of his buildings in such a manner as to produce harmony and a feeling of proportion.

Wood was a man who had a very capable insight into the turn events might be likely to take, and he tried to persuade others to see with him, but did not succeed far in this respect. Thwarted time after time, he pushed ahead and insisted on the people of his day accepting what they certainly did not always understand.

He was ably followed in his work by his son, who completed many of the unfinished schemes and built the Assembly Rooms between 1769-71.

Under an Act of 1789, a large portion of the city was rebuilt by Baldwin, his work including Bath Street with its interesting colonnades; he also commenced the Pump Room, which was completed by John Palmer.

Pulteney Bridge, erected about 1770, would seem to be the only work of Robert Adam, although his manner influenced much of the later work in Bath.

The styles of the eighteenth century could be divided into three groups: that of the first twenty-five years, when the gabled houses had large sash windows surrounded by bolection mouldings, when the interiors were panelled with wood and the rooms small and comfortable; the next fifty years, when the work was modelled on Classic Palladian lines and the interiors became spacious and dignified and plasterwork was brought into general use; and the last twenty-five years, when the free manner of Adam came into vogue, and the strong methods of earlier times gave way to detailed and abundant decoration.

The lecture, which was profusely illustrated by slides, was enthusiastically received by the meeting; and in replying to a vote of thanks proposed by Mr. W. Whitehead, A.R.I.B.A., seconded by Mr. Ascough-Chapman, F.R.I.B.A., Mr. Green referred to the lack of any information regarding Wood's early life, save that he came from Yorkshire. He attributed the decay of Renaissance tradition in Bath, as elsewhere, to the Greek Revival, with its consequent upsetting of many preconceived ideas of design and detail.

The next meeting will be at the Society's dinner, to be held at the Queen's Hotel, Leeds, on January 12, 1911.

SHEFFIELD SOCIETY OF ARCHITECTS.

A MEETING of the Sheffield Society of Architects and Surveyors was held on the 8th inst., when a lecture was delivered by Mr. W. S. Purchon, A.R.I.B.A., Lecturer of the Department of Architecture at the University, on "The Architecture of Cambridge."

The lecturer referred to the general belief among architects in the value of measuring and sketching as a part of an architectural education and to the summer course at Cambridge arranged in connection with the Department of Architecture in the University of Sheffield. It would have been difficult, he said, to find a more suitable place than Cambridge for the purpose. Mr. Purchon traced the development of English architecture as exemplified by Cambridge buildings. Starting with the Saxon tower of St. Benedict's, he dealt with the Norman Round Church, and a few Gothic buildings, pointing out that the finest Gothic work in Cambridge was that of the Perpendicular period, of which King's College Chapel was one of the finest examples. After dealing with some picturesque buildings of the Early Renaissance, the lecturer passed on to some of the fine work by Wren at Pembroke and Trinity, and to some of the buildings of the Later Renaissance by such men as Gibbs and Stephen Wright. He then dealt with the Greek and Gothic revivals and some examples of recent work. "We have regretted," he said in conclusion, "much of the destructive work of the eighteenth century, and some of the constructive efforts of the nineteenth; we have doubtless admired a good deal of work of men who have only recently passed away, and in the work of those who are still with us I hope we have seen something which makes us feel that architecture is still a living force. To be called upon to add to the magnificent architectural treasures of Cambridge is one of the greatest responsibilities and one of the greatest honours which can fall to the lot of an architect, and in the work of the last few years we must feel, I think, that the architects have realised this responsibility, and have designed buildings worthy of their surroundings."

MR. E. SEWARD *v.* THE CARDIFF CITY COUNCIL.

MR. MUIR MACKENZIE, High Court Official Referee, began on December 12 the hearing of an action brought by Mr. Edwin Seward, an architect and surveyor practising in Cardiff, against the Cardiff City Council for the recovery of fees payable to him under retainers given him from time to time to prepare plans for the defendants, and also damages for alleged breach of contract under which he was, as architect and surveyor appointed under the scheme, to do certain work.

Mr. Ernest Pollock, K.C., appearing on behalf of the plaintiff, said his client was a very well known architect and surveyor at Cardiff, and a man of very great reputation. The period of time covered by the transactions was long. On or about June 24, 1890, the plaintiff was directed by the Free Library and Museum Building Committee of the then Town Council of Cardiff to prepare elevations, sections, drawings, specifications, and bills of quantities, &c., in respect to the erection of a library and museum in Working Street, Cardiff. The library only was built, but the museum was abandoned. Then a site in Park Place, Cardiff, was contemplated, and that held the field for some time, various plans being drawn by plaintiff for the purpose of meeting various changes and alterations involved by the alteration of the scheme. Shortly before 1900, however, the defendants secured a much larger site, a place called Cathays Park, from the Marquis of Bute, and the Park Place site was given to his Grace. The defendants found Cathays Park far more roomy and, therefore, they went in for a much larger scheme. It was quite clear that Cardiff Council had in their minds a scheme of something like 150,000*l.* or 160,000*l.* By an agreement in writing of December 21, 1901, Mr. Seward was appointed architect and surveyor for the purpose of the erection of the museum buildings. He was to prepare all designs, plans, drawings, including detail and working drawings, sections, specifications, estimates, bills of quantities, &c., and he was to be paid 350*l.* on approval by the defendants of his plans and drawings, and also a commission of 5 per cent. upon the amount from time to time payable to any contractors under the building contracts. Ultimately, however, a still larger scheme gradually took shape. There was to be a National Museum for Wales, an enterprise that was much supported in the Principality. Rival cities, said counsel, became claimants for having the National Museum in their borders, and Commissioners eventually gave the pre-eminence to Cardiff so far as the museum was concerned. A Treasury grant was obtained. Counsel urged that the brochure published on behalf of the scheme, especially for the purpose of obtaining subscriptions, contained the drawings and the elevations which had been prepared by Mr. Seward as being the design and scheme for the National Museum in Wales. Under an Act the defendants were eventually empowered to transfer their exhibits and powers to the authorities of the National Museum for Wales. It was perfectly clear that Mr. Seward, by the agreement of 1901, was given the scope of a profitable employment, of which he had been deprived by the defendants transferring their powers and duties. Until 1907 Mr. Seward had gone on with this work on a scale which was large even in 1907. He understood that the defendants contended that by a clause of the agreement they were at liberty to give notice not to proceed further with the works, or to withdraw a certain portion. They argued that, therefore, Mr. Seward's remuneration under that clause was cut down, and that Mr. Seward could not say he was to be paid damages on any basis of a large scheme as contem-

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plated. He (Mr. Pollock) contended the defendants could not rely on a clause of an agreement which had really been torn up by the defendants, and not with the consent of the plaintiff. It was a contract which defendants had put out of their power to perform at all, and the plaintiff was left at a "loose end" to get what he could for his work. Mr. Pollock admitted he could not get over a plea of the Statute of Limitations raised by the defendants concerning the claim for work done in 1894. The main issue between them would be as to the effect of the agreement of December, 1901. Did the clause in that agreement give defendants any really effective right to put an end to the contract? He (Mr. Pollock urged it did not.

Mr. Seward, F.R.I.B.A., and a member of the Royal Cambrian Academy, said he had been practising in Cardiff for thirty-four years. He had undertaken many important buildings in that city and elsewhere. He was the architect, amongst other things, for the Cardiff Municipal Buildings and Council Chamber. He had been in close touch with the Corporation of Cardiff for many years. The plans for the erection of museum buildings in Cathays Park that he had prepared were for an index hall with its wings fronting south. There were alterations ordered by the authorities from time to time necessitating the raising the level of the index hall and the adding of 20 feet to the front. He prepared three sets of plans. He had charged in accordance with the scale authorised by the Royal Institute of British Architects.

Mr. Seward, giving further evidence on December 13, recounted an interview he had in January 1905 with Mr. Thomas, the chairman of the Museum Management Committee. He declared that Mr. Thomas on that occasion advised him that soon there would be probably important developments connected with the municipal scheme of a museum. Mr. Thomas told him that matters were evidently approaching a period when the important developments they had always had in mind were likely to be given effect to. As chairman, Mr. Thomas desired such information as could then be disclosed following their years of work that would enable him to show quite clearly the large scope of the enterprise. As a result of the conversation, in which he had shown Mr. Thomas various plans, he had promised that he would write him, making the position thoroughly clear. That conversation (said Mr. Seward) clearly recognised fully the scheme of 150,000*l.* to 160,000*l.* He wrote to Mr. Thomas in accordance with his instructions.

In further reply to Mr. Pollock, Mr. Seward stated that on April 26, 1905, he sent a subscription of 5*l.* to the National Museum scheme, because he had been invited by a member of the Corporation, and he responded as a citizen interested in the scheme.

Mr. Pollock referred to one of the points of defence raised. That was to the effect that Mr. Seward had asked the defendants (and that they had done) to take steps to see that the National Museum for Wales should be placed in Cardiff, and that he undertook to pay the defendants 5*l.* for the museum purposes. Under these circumstances the contract of December 21, 1901, was abandoned by mutual agreement, alleged the defendants.

Mr. Pollock said he should not have thought the defendants would have put such a plea on the record. It seemed so childish.

In the course of further evidence, the plaintiff said he had learnt by accident of the defendants' intention to promote the Parliamentary Bill for the handing over of their powers, &c. The preliminary announcements were so ambiguously worded that at the outset he did not recognise that his position was in the least degree touched. Witness subsequently opposed clauses in the Bill, and ultimately, as passed, the Bill provided that the Corporation should indemnify the Council of the National Museum against all obligations and liabilities that might accrue.

Mr. Pollock produced the covenant, dated April 15, 1910, saying it took the form of a lease of this site in Cathays Park of an area of four acres. There was a covenant providing for the expenditure in the erection of the building of a sum of 150,000*l.* in labour and materials.

Mr. Seward said that if he had proceeded with the work on the plans, involving an expenditure of 150,000*l.*, his fees recoverable would be 5 per cent. on that figure, in accordance with the scale of the Institute; but in this instance there had been a formal agreement between himself and the Corporation. The work would have included discussions, the preparation of plans that might arise, the perfection of plans into working drawings, the writing of specifications, superintendence, and clearing up of accounts at the end.

Mr. Pollock asked that, assuming the building had been erected from plaintiff's designs, would Mr. Seward have been entitled to charge for what he (counsel) called the first set of plans at 375*l.* and the second at 450*l.*, outside the 5 per cent. for carrying out the official plans?—Mr. Seward: Yes, but I do not know whether I should have done so had I been duly retained.

If the work had gone through, and you had received your 5 per cent. and your quantity surveyor's expenses, it would have been a matter on which there might have been a claim, but a claim on which you would not have pressed on the previous two items?—That is so.

You have not had the work to do?—No. I had the troublesome negotiations of years to do, and when that work reached the splendid fruition to which we were all looking forward for many years, I was placed in a most ignominious position professionally and from other points of view. There was no reason whatever, so far as my conduct was concerned.

Mr. Pollock: That is not suggested by the other side. At the time you entered into the agreement of December 1901 were you desirous of obtaining the opportunity of being the architect for this big scheme?—Decidedly.

Mr. Pollock then asked the plaintiff if he had received a document, dated August 18, 1909, in which the writer said: "I am instructed to offer you 1,100*l.* in satisfaction of all your claims against the Corporation. This they consider to be greatly in excess of any amount you may be legally entitled to"?—Mr. Seward: I took the letter to be an unconditional tender. He had replied, declining the offer, and referring to what he termed an uncalled for and cruel course on the part of the Corporation.

Mr. Francis Williams, K.C. (reading a passage in plaintiff's reply to this offer): "I consider the course taken in depriving me of the work to be uncalled for and most cruel." Cross-examining plaintiff on behalf of the defendants, Mr. Williams asked for an explanation.—Mr. Seward: They appointed me to the work under the seal of the Cardiff Corporation to the work, and they deprived me of it without cause.

Is it your view that the Cardiff Corporation ought not to have tried to get a museum at Cardiff?—No, sir; far from it. But when the National Museum for Wales showed itself to be a practical certainty, the Corporation ought to have kept faith with me as the person whom they had called upon under their agreement. They ought to have made perfectly sure that their undertaking should have been absolutely fulfilled.

Do you know the Council tried all they could to get the new body to take you on as architect?—They could have done so before it was too late. They could have devised methods by which their undertaking could have been carried out in the future work. The point he would make, plaintiff continued, was that while some really good-minded men on the Corporation were doing their best to undo the mischief which had been done respecting himself, a Bill was being promoted in Parliament—in secret, so far as he was concerned—which would have deprived him of not only a chance of being architect, but of receiving a penny for the twenty years' work that he had done.

Your complaint against the Corporation is that they ambiguously worded the phraseology of their Bill in Parliament?—No. But I think it was intended to wipe me out.

In the course of cross-examination concerning the various plans, Mr. Seward insisted that all of them were necessary, as were also fresh ones, owing to changes made in the existing plans, in consequence of directions he received. He claimed for loss of architect's and quantity surveyor's commission, a total amount of 10,875*l.*, less 2,000*l.* establishment charges, as well as damages for the breach of contract he alleged.

In the course of further cross-examination on December 14, the plaintiff said it was not unusual for an architect to charge for rough plans which became abandoned, especially if they concerned important public buildings. If the architect were sitting down on occasions with a client and was drawing and sketching in a consultative way he would not be likely to exercise such rights as he might perhaps have in this matter of so charging. Other circumstances might open up, however, another position than that ordinarily applying between architect and client. Matters of detail were then discussed at great length, Mr. Seward explaining the status of various plans as affecting each other.

(*The case is proceeding.*)

MR. JAMES MILLER, A.R.S.A., F.R.I.B.A., of Glasgow and London, has prepared plans for a variety theatre to be erected at the south-west corner of Hope Street and Renfrew Street, Glasgow, with accommodation for 2,000 persons.

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THATCHING.*

THE art of thatching can be learnt by any intelligent farm labourer, if he is given a few opportunities for practice and a little instruction. Farm hands frequently possess a natural aptitude for work of this kind, and an industrious man will soon become proficient.

A thorough knowledge of thatching, like that of any other branch of farm husbandry, cannot be gained without careful observation and frequent practice, but the beginner can commence by thatching straw ricks and thus acquire the skill necessary for the more important work of thatching corn and hay ricks.

The thatcher's outfit is neither a large nor an expensive one; it consists of a bill-hook, a paring knife, and a pair of sheep shears for trimming the eaves, a large "thatching fork" to hold the drawn straw or "yealms," and a wooden hand-rake with iron teeth.

Other articles necessary for thatching are a ladder sufficiently long to reach the ridge of the stack when laid perfectly level with the roof, a quantity of pegs, binding cord or oakum, a suitable wooden mallet or other implement to drive in the pegs (a flat leather attached to the wrist, and covering the palm when pressing the pegs home, serves the same purpose), and a running noose to convey the yealms of straw to the thatcher.

The principal materials used for thatching purposes are straw, reeds, and heather, according to the purpose for which they are intended. Oat and barley straw are only serviceable where the corn to be covered has not to remain in the rick for any considerable length of time; well-grown stiff wheat straw will answer all general purposes on the farm, but for more lasting purposes, rye straw and reeds are to be preferred, heather being mostly used for ornamental thatching—as, for example, model dairies, cricket pavilions, and summer houses.

A thatched roof has a picturesque appearance, which is by many preferred to the grey slate or red tiles which top the modern country cottage, while this method of making roofs watertight is adopted to a considerable extent in the case of such erections as summer houses, pavilions, and arbours. Different methods of thatching are practised in different districts, but the following may be taken as suitable for general practice.

Straw is the most usual medium for thatching houses, and it is employed in one of two ways—firstly, by laying a covering of fibrous turf over the roof and pushing the straw through the turves; or, secondly, by sewing the straw directly to the roof.

The material must in all cases be prepared beforehand, this work affording a very suitable occupation to be carried on under cover during wet weather. The straw is simply drawn from the heap in the usual manner, the only exception being that more care is exercised to exclude all short ends or pieces of straw, so that, when properly prepared, it will be perfectly straight.

The yealm of straw is then gathered in the hands and a small quantity is pulled out at one end, turned down, and wound round the top of the yealm, forming what is known as a "staple." The projection thus formed at the head of the staple prevents it from being withdrawn once it has been inserted in the turves. When prepared in this manner, the staples are bound together a dozen at a time and stored in a dry place until required for use.

The joists are fixed on to the roof in the usual manner, wooden runners being nailed on at about six inches apart; these runners are about three inches broad. The turves are placed upon the roof, working from the bottom and proceeding in an upward direction as with the slates. When cutting the turves, a curved cutting-iron must be used, so as to obtain turves thick in the centre but gradually tapering off towards the sides. Thus, when laid on the roof, the overlapping edges will make the turf covering level, and the roof will be of one thickness throughout.

A thatching-iron now becomes necessary. This implement is slightly forked at the apex in order to catch the twisted head of the staple of straw. In this manner the latter is pushed through the turf, and is prevented from coming out again by the "head" of wound straw. The work of laying the staples must be commenced at the eaves, and should proceed upwards until the ridge is reached; at this point a layer of turves is placed over the straw in order to form a "bolster" or well-defined ridge, and the thatching is then complete.

When preparing the roof for the second method of thatching, namely, sewing the straw directly to the roof, the joists are laid, the wooden runners nailed on, and the straw prepared in the same way. The straw is then sewn directly to the wooden runners, commencing at the bottom and working upwards to the ridge. Sewing twine is used for this purpose, and the work will be found quite a simple operation after a little practice has been obtained. In order to finish off the ridge, turves may here again be requisitioned as in the former method, or, as an alternative, two pieces of wood may be utilised. In the latter case, the boards should be cut to the same length as the roof and fixed so as to overlap the thatch for some distance on each side. This method of thatching is perhaps most extensively practised, as it is often impossible to obtain good, firm, fibrous turf.

In certain districts heather is used extensively in the thatching of dwelling-houses, and particularly rustic summer houses, and similar buildings. This material is, of course, not always procurable in abundant quantities, but in the north and central counties of Scotland it forms the staple medium for thatching purposes. When carefully cut, heather will require but little preparation beyond straightening out. The roof is prepared as in the case of straw thatching (second method), and the heather sewn fairly tightly and closely together. This makes an excellent and very durable roof. Reeds, where they are procurable, are also a most valuable material for thatching purposes. They are used in a similar manner to straw, being either sewn direct to the roof or inserted through turves. Broom is used extensively in other districts in a similar manner to heather.

The cost of labour for thatching dwelling-houses, &c., generally amounts to 4*s.* 6*d.* per "square," or hundred square feet, while reeds cost as much as 5*s.* per square. On the roof of a dwelling-house, ten bundles, or 5 cwt. of straw will be required to each square of thatch, and one hundred of these bundles will cost approximately 105*s.* When thatching is carried out in a thoroughly expert and experienced manner, the roof should remain quite watertight for about thirty years if composed of the finest quality wheat straw, or for forty years if reeds be employed. If, however, the work be done in an indifferent manner, it may not last for more than ten years.

* Abstract from a leaflet (No. 236) issued by the Board of Agriculture and Fisheries.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* (New York) fully illustrates a large country house, the residence of Mr. Wallace H. Rowe, at Cobourg, Ontario, Canada, of which Messrs. Rutan & Russell are the architects, which is rough-cast externally and eclectic in its interior design. Specimens are given of students' designs in connection with the Society of Beaux-Arts Architects. Domestic work by Mr. James Purdon includes several houses of moderate size in Massachusetts. A descriptive illustrated article by Mr. W. W. Bosworth is a continuation of the account of "A Little Journey in the Oise Valley," commenced in September.

La Construction Moderne (Paris) illustrates a villa at Gip, in the department Seine-et-Oise, by Messrs. Albert and Maurice Turin, and a large commercial school at Paris by Mons. Masson-Detourbet.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Jean Goujon's Sculpture.

Sir,—The learned paper of Professor Blomfield on Jean Goujon was most interesting reading; it called to my mind a figure in the church of SS. Gervais and Protais at Gisors, which I have seen on three out of my many tours in France. It is an emaciated recumbent figure of a dead man, said to have been a celebrity of the place, and, as is also the organ-loft, attributed to Goujon. In spite of the gruesomeness of the subject the anatomical handling of the figure is wonderfully true and realistic. If I could be assured on good authority that this is Goujon's work it would add much to the interest I have always taken in it. Local tradition says that the man died of a disease that compelled its unfortunate victim to starve. The sculptor, be he who he may, well shows him as a mere "bag of bones"!—Yours faithfully,

E. Swinfen Harris, F.R.I.B.A.

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The Architect.

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LOMBARDIC ARCHITECTURE.

THE theory which Signor RIVOIRA has put forward for the origin of Romanesque or, as he terms it in accordance with his theory, Lombardic architecture is worthy of consideration. Historically it is founded on the facts that under MAXIMIAN (286-310) Milan became the official residence of the Emperors, and that thus the craftsmen of Lombardy were afforded a wide field for the exercise of their ability. When, in 404, HONORIUS transferred his Court to Ravenna, this city was regarded as the seat of government and the capital of Italy until ODOACER put an end to the Western Empire in 476. Then Signor RIVOIRA assumes, as is probable, that not a few, and among them the best craftsmen of Milan, migrated to Ravenna.

In his great work * on Lombardic architecture Signor RIVOIRA endeavours to show that to the school of Ravenna is due the first inception of the essential characteristics of what is usually termed Romanesque architecture. His view is that Italy, during the period of Ravenna's greatness, was not obliged to borrow artists from the East, whether painters, mosaic workers, goldsmiths, carvers, or architects and builders, but that the works which influenced the origin of Lombardic architecture were executed in Ravenna, as regards architecture by Italian craftsmen; in the case of sculpture, restricting the consideration to works of purely Byzantine style executed in the days of THEODORIC (493-526) and of JUSTINIAN I. (527-565), to Greek artists, after allowing a very modest share to the chisels of the school of Ravenna; and in the case of sculpture carried out in a form and style of carving which is merely Byzantinesque, to Italian artists.

This view is supported by Signor RIVOIRA in a detailed investigation of the important Romanesque buildings of Ravenna. The first and oldest of these is the Basilica Ursiana, on which, although rebuilt in the eighteenth century, a great deal of the author's theory rests. This church was founded and completed by Archbishop URSUS (370-396), and, says Signor RIVOIRA, presents five notable features, the creations of the school of Ravenna, and not of Constantinople, as is the universal but erroneous belief.

First, it is the oldest instance of a basilica with the apse at the east end. Before this apses were placed at the west, not only in the Western world, but in the Eastern, as in Helena and Constantine's Church of the Holy Sepulchre at Jerusalem (327-335), and in the Constantinian basilica at Baalbec.

Second, the Basilica Ursiana is the first example of an apse curvilinear internally and polygonal externally, the credit of which departure must therefore be given to the builders of Ravenna, and not to the Byzantines, for at Constantinople the first example of such an apse that can be dated with certainty is in the church of St. John Baptist, erected by STUDIUS in 463; and at Salonica St. Sophia provides the earliest instance (about 495). In Syria, two very early dated specimens are presented by St. George at Ezra (515-516) and the cathedral of Bosra (511-512).

Third, the Ravenna basilica contains the earliest example of capitals surmounted by pulvins, or *dosserets*, a characteristic feature of both the Ravennate and the Byzantine styles. Signor RIVOIRA discusses the origin of the pulvin, and even suggests that the Egyptian use of cubes on capitals, as at Denderah, is a prototype of the Romanesque treatment of the *dosseret*.

The fourth notable feature is the construction of the domical vault entirely of tapering tubes inserted one inside the other. To maintain this proposition Signor RIVOIRA has to put on one side the use by Roman builders of amphoræ, which he admits is as old as the time of CALIGULA (37-41), in whose palace on the Palatine they are employed to diminish the weight on the haunches.

The fifth peculiarity of the Basilica Ursiana is that it presents the oldest example of a spherical vault in masonry with a wooden roof above it, which treatment, says the author, is not met with in any dated Eastern structure of the kind earlier than, or even contemporary with, the Basilica Ursiana at Ravenna.

In his description of the Basilica of San Giovanni Evangelista, founded by GALLA PLACIDIA in 425, Signor RIVOIRA deals fully with the use of blank arcading as a means of wall decoration, and shows that it had been used earlier in Romanesque work and was borrowed from the Romans, who employed it from the age of AUGUSTUS onwards; so that, although characteristic of Romanesque work, it cannot be said to have originated either from the school of Ravenna, from Byzantium, or from the East, as, although it is found in so early an example as the Palace of CHOSROES I. (531-579) at Ctesiphon, this Persian building, like others, owes much to the aid of builders from the Romano-Byzantine Empire, if we are to believe the quotation from THEOPHYLACTUS (638) given by Signor RIVOIRA:—"They say that the Emperor JUSTINIAN sent to CHOSROES Greek marble and skilled architects and master masons, who built him a palace in the Roman style not far from Ctesiphon."

San Giovanni Evangelista is, says our author, distinguished by two notable characteristics: first, the apse is enriched by arcading supported by columns; second, the arcading is marked off from the wall surface by a visible framing line flush with the arches, each of which is enclosed by a ring of bricks laid lengthwise and fitting exactly.

The Mausoleum of GALLA PLACIDIA, erected about the year 440, is given by Signor RIVOIRA as the oldest example amongst tombs and churches of the use of a Latin cross with rectangular extended arms and not mere apses opposite to one another and starting directly from the central space. This building is also noted as an example of the use of spherical pendentives, and affords the author an opportunity for an interesting discursus on the early history of pendentive vaulting.

The Chapel of San Pier Crisologo, erected by Archbishop PETER CHRYSOLOGUS (433 or 439—449 or 458), affords an early instance of the use of brick arcading springing from corbels grouped between lesenas, or pilaster strips, as a decorative rather than a constructive adjunct, and a similar treatment is exhibited in the Baptistery of Neon or San Giovanni in Fonte.

In the well-known Basilica of Sant' Apollinare Nuovo, erected by THEODORIC about the year 519, Signor RIVOIRA finds the employment of Greek carvers alongside of architects and builders belonging to Ravenna. The campanile

* *Lombardic Architecture: Its Origin, Development, and Derivatives.* By G. T. Rivoira. Translated by G. McN. Rushforth, M.A. In two volumes. (London: William Heinemann. 63*s.* net.)

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at this church, of which the date is fixed during the episcopate of JOHN, who filled the see from 850 to 878, is made the text of an explanation of the use of campaniles and of their early history.

The Mausoleum of THEODORIC, erected about the year 519, with its remarkable monolith cupola, more than 30 feet diameter, is briefly described by our author, who then passes on to an account of the Church of San Vitale, and endeavours to combat the usual belief that it was the work of Byzantine builders, and he claims JULIANUS ARGENTARIUS, the architect both of San Vitale and Sant' Apollinare in Classes, as a Ravennate architect of the first rank. The carving in the Church of San Vitale is admitted to be the work of Greek artists.

Signor RIVOIRA goes on to prove that many other buildings of early Italian Romanesque are the work of, or influenced by, architects and builders of the school of Ravenna, which he thus makes the dominant element of Lombardic architecture, or rather of the basis from which Lombardic architecture was afterwards to be developed.

The book is excellently and profusely illustrated, and, whether we are prepared to admit the truth of Signor RIVOIRA's reasoning or not, is indispensable to any student who would thoroughly understand Romanesque architecture.

NOTES AND COMMENTS.

THE resolution of the Council of the Royal Institute of British Architects, published in our columns last week, making it "unprofessional conduct" for any Member or Licentiate of the Royal Institute to take part in any competition of which the conditions are not in accordance with the published regulations of the Institute, and therefore barred by resolution of the Council, is the natural corollary to the adoption of those regulations, which state that members "do not take part" in competitions not in accordance with the essential clauses. The resolution, however, makes it incumbent on the Council and the Competitions Committee to act with considerably greater promptitude than has too often been the case in dealing with the conditions of competitions. It is unreasonable to expect that architects, members of the Institute, shall wait till half the time allowed for the preparation of the drawings has elapsed without knowing whether or not any particular competition is *taboo*, and the Institute only makes itself ridiculous when its decision is announced in the *Journal*, as has happened in at least one case, after the date for sending in drawings. It is also incumbent on the Council to veto all open competitions, publicly advertised, of which the conditions are not in accordance with the regulations of the Institute. There has been some laxity in the past in this respect, and this must be amended.

THE extension of the Mall to Charing Cross seems to have arrived at an *impasse*. Shortly, there are three authorities involved, representing three sections of the community, and the question is, Who is to pay? The three authorities are the Government, the London County Council, and the Westminster City Council, and the question is whether the nation, the County of London, or the City of Westminster should pay. There are two schemes in view, and it is generally admitted that the larger of the two, which would cost in round figures 150,000*l*., is preferable. The London County Council and the Westminster City Council are willing, on behalf of their constituents, to contribute each one-third of the cost if the Government, out of the national exchequer, pays the remainder. Really, of course, the citizens of Westminster would pay the largest share, the citizens of London County more than one third, for the citizens of Westminster have to contribute to the county rate and the national exchequer as well as to their own municipal expenditure, and the citizens of London County would also pay part of the ostensible one-third of the cost to be found by the Government. From the report of the Improvements Committee of the London County Council it



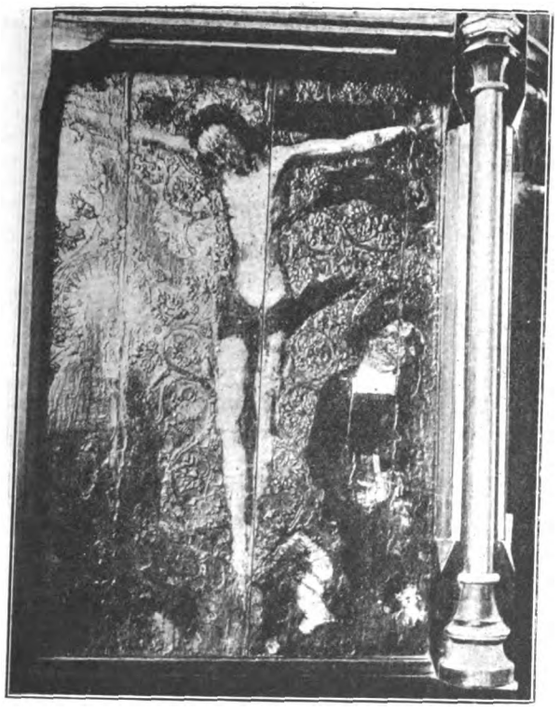
ST. SIMON, FROM SCREEN IN CAUSTON CHURCH, NORFOLK.

appears that the Commissioners of Works obtained authority in the Metropolitan Improvements (Funds) Act, 1904, to apply a certain fund, created for Metropolitan improvements under the Battersea Park Act, 1851, towards the opening of the Mall into Charing Cross and other works connected therewith.

THE Government now objects to paying any part of the cost of connecting the Mall improvement with Charing Cross, but we think the Improvements Committee of the London County Council are fully justified when they say in their report:—"It seems to us clear that it was the intention of the Government to complete the improvement without any co-operation on the part of the Council or of the local authorities concerned. This view is confirmed by the fact that between June 1896 and the receipt of the letter of January 1909 the Council was neither consulted nor afforded an opportunity of expressing its views, nor even officially informed of the Government's action with regard to the improvement. It need hardly be pointed out that during the past twenty years the value of property in the neighbourhood has increased. If the Council had received any intimation that it was expected to complete, or to assist in the completion of, the improvement it could, by purchasing property, have anticipated in some measure this increase, and it could have taken advantage of any favourable opportunities which might have arisen for dealing with the property, especially as it holds, or has held, a considerable extent of property in Spring Gardens and Charing Cross.

"The improvement will, of course, be of advantage to the general and local traffic, and we admit that, in this aspect, the matter is one which greatly concerns the Council. On the other hand, the improvement is, we submit, desirable in order to open up the Government buildings, and still more desirable in order to provide a fitting approach to the Memorial to Her late Majesty Queen Victoria. In this respect the improvement is of national rather than of local concern, and a substantial proportion of the cost should therefore be borne out of national funds. If the Government had been prepared to avail itself of the favourable offer which we made to it, and to contribute accordingly one-third of the cost, we should have had no hesitation in advising the Council at once to undertake the work and to contribute one-third of the cost. In this case the improvement would very probably be completed, as far at least as the widening of

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PANEL SHOWING GESSO GROUND, FROM REREDOS, ST. MICHAEL'S CHURCH, PLEA, NORWICH.

the road is concerned, by the middle of next year. In the absence of any offer by the Government to co-operate in the matter we have no alternative but to recommend 'That the Council is not prepared to carry out the extension of the Mall to Charing Cross unless the First Commissioner of H.M. Works, &c., agrees to advise the Government to contribute one-third of the net cost.'"

MR. MERVYN MACARTNEY, the Surveyor to the Fabric of St. Paul's Cathedral, is bravely and rightly, by repeated letters to the *Times*, drawing, or endeavouring to draw, public attention to the danger that is imminent from the proposed tram subway in St. Paul's Churchyard that forms part of the Corporation's scheme for the new St. Paul's Bridge, and in his letter which appeared on the 15th inst. gives a diagram showing how very similar are the conditions to those of Holy Trinity Church, Kingsway, which became so dangerous that it had to be pulled down, the cause undoubtedly being the excavation of subways in its proximity. It is the greatest mistake in the world to suppose that London stands on a solid bed of clay. It does nothing of the sort. The subsoil of London is permeated through and through in all directions by what can be no better described than underground rivers. These were at one time on the surface, but, although they are now hidden from sight, they still exist and flow at various depths. One has only to keep one's eyes open in the tube railways to see spots of damp caused by the percolation of water from these underground streams, which even the external lining of cement that is supposed to have been formed by pumping into the space left between the iron and the hollow excavated is unable entirely to exclude. We know personally of many cases in which building operations have disclosed flowing water at 6, 10 or 20 feet below the surface. Hence excavations for tube railways or tram subways cause disturbance of the soil, often to a considerable distance. We know that water exists under St. Paul's Cathedral, and it is hazardous in the extreme to carry out such a tram subway as is proposed in connection with the St. Paul's Bridge scheme.

THE interesting "Notes on the Architectural History of Lincoln Minster from 1192 to 1255," by Mr. FRANCIS BOND and Mr. WILLIAM WATKINS, which appeared in the R.I.B.A. *Journal* (3rd series, Vol. XVIII., No. 3), have been republished in pamphlet form, so that one may with this in hand follow the lines of reasoning on which Mr. BOND has founded his views of the original treatment of St. Hugh's Choir.

THE Artistic Hoardings Competition, for which Mr. W. H. LEVER, J.P., has provided 100*l.* prize money, is not for the ambitious pupil or office boy, as, like the Gidea Park competition, it is open only for executed work, not for paper schemes. The hoardings to which the prizes are offered must have been erected and photographed with their posters upon them. Then the assessors are to visit and view the hoardings that they may think worthy of a prize before making their award. As hoardings are usually only of ephemeral existence, this condition seems to still further limit the number of possible competitors.

TOWN planning is to have its own organ—in addition, that is, to the very good publication of the Liverpool School of Civic Design. The new venture is to be known as *Garden Cities and Town Planning*, and is, we understand, to be the official organ of the Garden Cities and Town Planning Association and the National Advisory Town Planning Committee. The first number is to appear next month.

IT is to be regretted that it has been found necessary to abandon the project for the exploration of the site of the Romano-British town of Verulamium, on the outskirts of St. Albans, owing to Lord VERULAM, the owner of the site, not having come to a satisfactory arrangement with the Society of Antiquaries, who had offered to undertake the work. The failure of negotiations is all the more regrettable as Verulamium is by far the largest of such remains in this country, and it was anticipated that the excavation, which would have lasted about thirty years, would have yielded a rich harvest of interesting relics. The town was about twice the size of Silchester, near Reading, on which the Society have been engaged for about twenty years, bringing the work of excavation to a successful conclusion only last year. Silchester is the first instance of a complete Roman town having been entirely uncovered. In this, as in other similar cases where the land is taken out of cultivation during the work, only a portion of the site is dug up at a time. When the ruins have been exposed and photographed, and careful plans have been made of the streets, houses, temples, &c., the ground is put back and restored to cultivation before another section is undertaken.

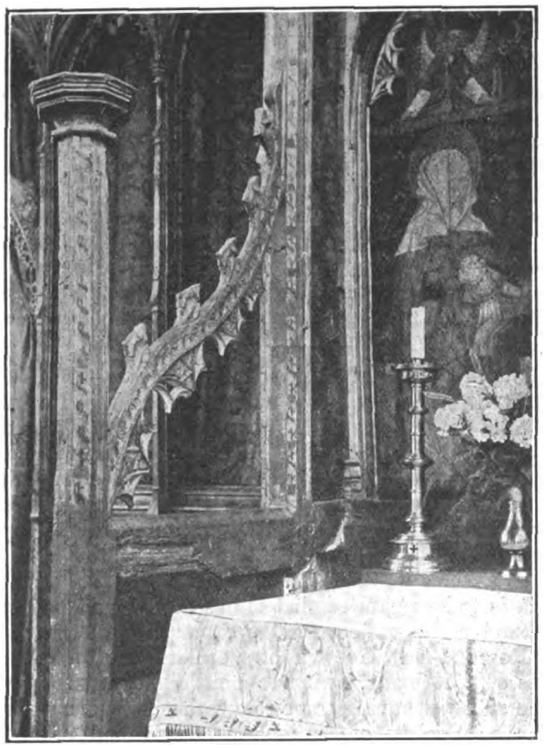
THE Board of Education now insists that in new schools, instead of a central hall with class-rooms opening out of it, the hall must either be detached entirely or must have corridors separating it from the class-rooms. We do not agree with the Surrey Education Committee that this is not an improvement. Central halls have for a long time been abandoned in Germany and America, both of which countries are certainly ahead of ourselves in education.

EAST ANGLIAN ROOD SCREENS AND THEIR PAINTINGS.

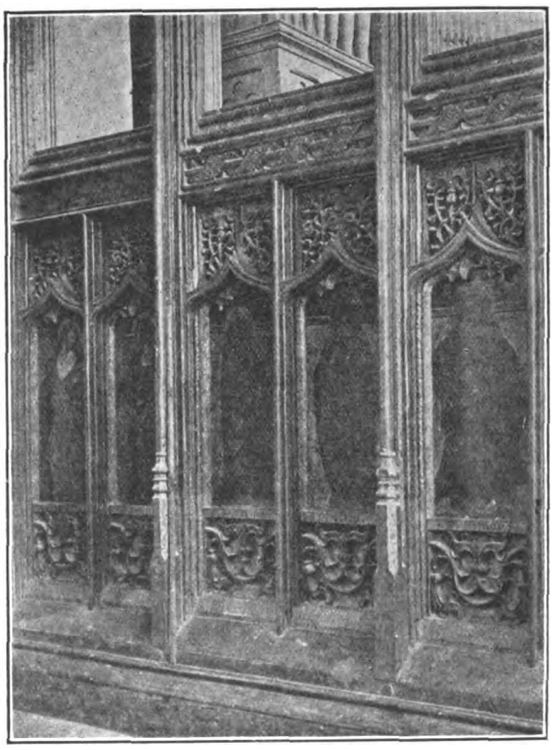
AT the Northern Architectural Association, on December 14, Mr. H. C. Charlewood, F.R.I.B.A., in the chair, Mr. William Davidson read a paper on the above subject. The lecture was illustrated by numerous coloured drawings, photographs, and about a hundred lantern slides.

Mr. Davidson, who has been making a special study of ecclesiastical architecture and decoration in East Anglia for the last ten years, opened his lecture by emphasising the great richness of East Anglia in ecclesiastical art of all kinds, but more especially the decorative art of its rood screens. After indicating roughly the origin and development of rood screens, he described in detail the leading screens in the district, analysing the main features in their construction and design. The period of greatest activity, he stated, was between the years 1480-1520. At the Reformation much of the work was destroyed, and even in comparatively recent years much damage had been done by renovating and repainting. The mediums employed by the mediæval craftsman were discussed, and the place and value of gold in the mediæval decoration

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FLYING-BUTTRESS AT LADY CHAPEL ALTAR, RANWORTH CHURCH, NORFOLK.



PART OF SCREEN, SHOWING NINETEENTH-CENTURY LEADWORK WORSTEAD CHURCH, NORFOLK.

was pointed out. From his close and exhaustive study of the screen painting Mr. Davidson concluded that the artists were natives of the country, as the work showed so unmistakably the influence of the climatic and geographical conditions which exist in this part of England. The best painted screens were situated in the marshland districts—Ranworth, Barton Turf, Ludham, &c. The general formation of the land, with its marshy pools, stretches of broads, shaded by woodland and reeds, over which the morning mists linger at the approach of dawn, and which reflect the glory of a setting sun, is just such as we might expect to produce a great school of colourists. With a misty background, and in the brilliant sunlight, the red of the foreground poppies, the green of the grass, and the gold of the corn blaze out with dazzling brightness; and this combination of colours satisfying the visual sense of completeness was no doubt adopted by the artist as the main basis of his colour scheme. There are few variations to this scheme. The alternating scheme of red and green with an all-over use of gold was the main feature in East Anglian mediæval decorative art.* The decorative value of rood screens as church furniture was clearly illustrated by several excellent views of church interiors from Norfolk and Suffolk, and the harmony existing between the architecture and decoration was strongly emphasised, the design, drawing, and colour being such as enhanced the architectural detail and general effect. The great unity which existed in the mediæval church was shown as being carried out in the tiles, wall painting, glass, roof, altar, and in every part of the church, showing that the mediæval builders had in view a culminating scheme both in composition and colour. In discussing the figure paintings and their emblems the screen at Ranworth was described in detail. Particular attention was drawn to the figures of St. Barbara, St. George, St. Michael, and the head of St. Philip. At Cawston, St. Philip, St. Matthias, and St. Matthew were mentioned as fine examples of the work of a portrait painter. At Barton Turf, St. Raphael was described as exquisite in drawing and colour. The existence of foreign saints on many of the screens was no evidence, in Mr. Davidson's opinion, for the assumption that foreign artists were employed in the work, as the saints were universally recognised as belonging to the whole Church, even the patron saint of England, St. George, being a native of Cappadocia. The original object of the figure painting, the lecturer considered, was to educate the people (few of whom could read) in the life history of the saints. Their decorative value being perceived, the work was then continued because of decorative effect. The screens of Ranworth, Cawston, Barton Turf, Worstead, Ludham, Trunch, and Marsham were described in detail, while many of the lesser screens were referred to and slides shown of many figure panels and details. Chapel screens and western gallery screens were mentioned and illustrated. In classifying the paintings, four distinct types—viz., archaic, conventional, decorative, and naturalistic—were indicated. The first three types were shown to be the most appropriate for decorative purposes, especially when associated with Gothic architecture. The foreign influence found on such screens as Ranworth, Cawston, and Barton Turf was suggested as being due possibly to the introduction of the robes of the clergy from Italy and to the intercommunication between the Flemings and this country, and through the Flemish and German schools from North Italy. Many artists were employed in the work, as the best screens were distinctly the work of different men, and showed very distinct individuality. Mouldings and floral ornaments were apparently copied from stock pattern-books, as much repetition was to be found. Mr. Davidson considered that Ranworth, on account of its special features (the double canopy, parcloses, and reredoses) and the perfect harmony existing between its architecture and decorative composition and detail, was the finest painted in England, though at Cawston the mouldings were of a finer proportion, and at Barton the technique of the painting of heads of figures was finer. In touching on the condition of decorative art of the present day, the lecturer considered that the present school of painting was too pictorial, and lacked the imaginative and decorative qualities necessary for association with architecture, the true principles of the application of colour architecture not being understood. He strongly advised architects and decorative artists to study the principles illustrated in the ecclesiastical art of East Anglia.

* [In our observation, the earliest colour schemes of the period on which Mr. Davidson is speaking were in white, red and gold only. Then blue was used later and green not until the sixteenth century. —ED.]

ELTHAM MANOR.*

(Concluded from last week.)

IN 1648-9 the Parliamentary troops assisted in damaging and plundering the Royal palace. On the establishment of the Commonwealth, the palace was seized by Parliament and sold; at the same time the parks were broken into, and the deer dispersed and killed. The work of devastation thus begun was continued until the greater part of the palace was reduced to a heap of ruins; and, although the property was recovered by the Crown at the Restoration, no pains seems to have been taken to save the place from destruction; for the old palace was practically turned into a quarry, and stone after stone carried away, so that when Charles II. came to the throne the palace was in ruins, all that was left standing

* Read at a meeting of the Upper Norwood Athenæum by Messrs. Frederick and Herbert Weise.

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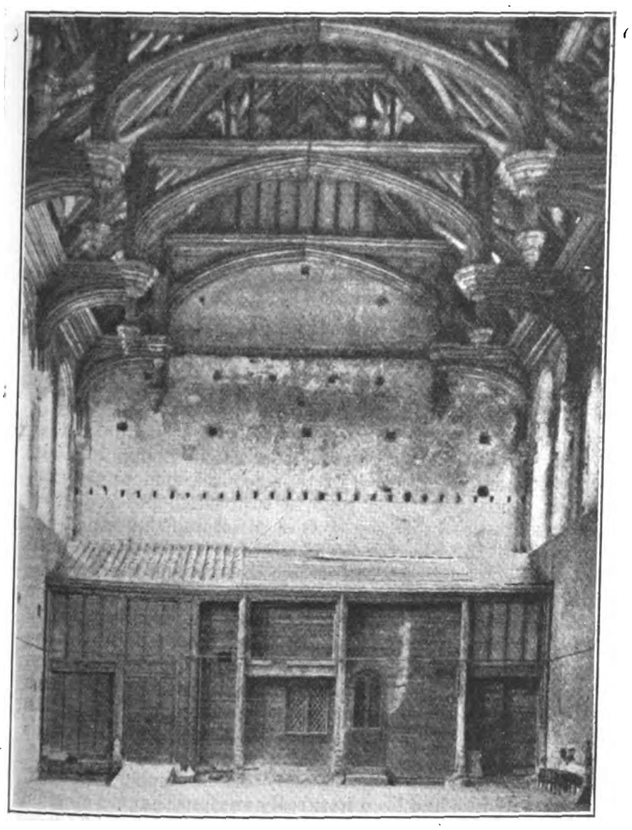
being the majestic great hall, which was used up to a recent date as a barn and a storehouse for agricultural instruments.

At this date a parliamentary survey was made of Eltham Palace as follows:—

One fair chapel, one great hall, thirty-six rooms and offices below stairs, two large cellars, above—called the King's side—seventeen rooms; Queen's side twelve; Prince's side nine—in all thirty-six lodging rooms; thirty-five bays of buildings round the courtyard, which contained one acre of ground, the said bays of buildings containing about seventy-eight rooms used as offices. The whole were much out of repair, and the materials were valued at 2,753*l.*, exclusive of the charge of taking down.

Eltham Great Hall.—The length of the hall is 101 feet by 36½ feet by 55 feet high, having a splendid carved roof of the open hammer beam type, "made of sweet chestnut beams 28 feet long by 17 inches square. The roof is said to resemble that in Westminster Hall, but that the lighting of the hall differs from Westminster and other great halls, being lit from both sides on north and south.

Mr. J. C. Buckler, who made a detailed survey of the palace area in 1828, describes the hall as "the master feature of the palace, rising in the centre of the surrounding buildings as superior in the grandeur of its architecture as in the magnificence of its proportions, and appearing to have retained its original character, for no improvement could have been desired either in the convenience or the beauty of its architecture, and was standing complete as built, with the exception of the "loover." Mr. Buckler also writes: "Walls of brick were often in this period substituted for those of stone. The same material forms the walls of Eltham Hall, under a case of stone, but brick alone was commonly used and engraved on masonry, as in this example. Its peculiar ornaments, in addition to carved work, were distinguished by black bricks arranged in various patterns over every blank surface, and specimens of these decorations remain on the west and south walls of Eltham Hall (1828).



BANQUETING HALL, ELTHAM.

There were suites of rooms at either extremity, the screen at the last end being designed to shut off views of the doors leading to the kitchen; at the other end was placed the throne with the octagonal fire hearth in front (not quite under the frame work, whch denotes where the ancient "loover" was), so as to draw, it is thought, the smoke well away from the royal table.

You will notice also the ample spaces some 20 feet high under the windows, which were originally covered with tapestry, but this has all disappeared. There is a tradition that a part of this was found in use as floor coverings of some of the houses after the dismantling of the palace at the time of the Commonwealth.

A little while ago Mr. A. W. Godfrey made a very fortunate and important discovery of an original plan of Eltham Palace in the library of Hatfield House, which though unsigned is thought to be the work of John Thorpe, about 1590; and Mr. Godfrey has written an interesting account of this in the "Architectural Review."

This plan gives an accurate idea of the arrangement of the palace, which before was only conjectured.

Mr. A. W. Clapham says that in the building accounts of the reign of Henry VI., the chapel was being completed then; as mention is made of the construction of a screen, and of the



THE MANOR LODGE, ELTHAM PARK.

two staircases to the gallery above. He also fixes the date of the great hall, one of the fortnightly returns of the expenditure when the roof was being framed being, "coste and expense don upon the bildyng of the Newe Halle wytn the manor of Elthm in the charge of James Hatefield from Sunday the XIX day of Setembr, the XIX year of the reigne of our sovreign Lord, King Edward the iiijth unto Sunday the iii of Octobr the yer aforeseid."

It also gives the wages of the freemasons, hard hewers, carpenters (including chief warden and under warden), plumbers, smythes, labourers, and clerks, also that thirty great iron "spykynggs" were bought for the roof, and ten great "clamps of yron for the bynddyng of the princyples."

There is also mentioned six loads of "Raygatestone" at four shillings a load, commonly known as Reigate firestone, and that £140 13*s.* 6*d.* was spent in the fortnight.

Mr. A. W. Godfrey suggests that the mediæval visitor to the palace would see on his left, after crossing the bridge and entering the great court, a long wooden arcade or "pentise" such as surrounds the court at Windsor, this feature being repeated in the corridor leading from the hall to the chapel, and also round the office courts on the south side of the hall.

Those buildings that were nearest the hall were probably single story erections. He thinks also that the three principal towers at the angles and one in the centre of the south front are perhaps part of the original fortifications of Anthony Beke, Bishop of Durham; and that the range of Tudor windows on the west side of the hall were made when Henry VII. rebuilt that side; and, further, that the terraces are probably of Queen Elizabeth's time, as a large sum was expended during her reign.

The lower part of the boundary walls can be still seen; that on the west side being 332 feet long.

The Pons Hauriabilis was most probably where the drawbridge is marked on the plan; this being also a private drawbridge which Mr. Clapham says was made for Henry VIII.'s convenience in leaving the palace unobserved when visiting the King's Gardens then on the east side of the palace.

As Mr. A. W. Godfrey graphically remarks:—"The fame of Eltham must however rest upon the exquisite beauty of the great hall, the timbered roof heavily moulded and adorned with finely shaped pendants, its two rectangular bay or oriel windows, with their elaborate vaulting and the splendid range of windows along both sides, which set the scale, and still enrich the design, in spite of mutilation and decay. All these have been carefully recorded by Pugin in the seven plates in his "Specimens of Gothic Architecture," Volume I.

In 1832 there was some talk about pulling down the great

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hall and removing the roof to Windsor, but it was afterwards decided to partially repair it, and the Government advanced a small sum for the purpose and placed the work under the superintendence of Mr. Smirke.

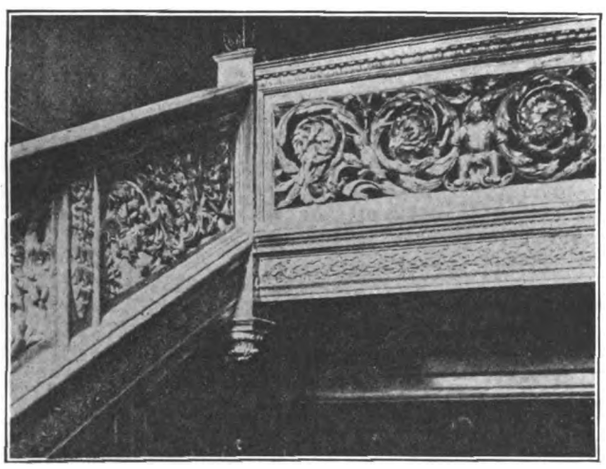
Eltham Lodge.

This fine old manor lodge was built in the solid old Dutch style about 1663 by Sir John Shaw, who was granted a lease of the manor by the trustees of Queen Henrietta, mother of Charles II., and John Evelyn the diarist confirms this date by mentioning a visit here on July 14, 1664, although he did not seem to entirely approve of the arrangement of the house.

In Ireland's "Kent" it is mentioned that Sir John Shaw besides other rewards had the dignity of a baronet conferred upon him, by letters patent Ap. 15, 1665, for the assistance he afforded Charles II. during his exile, and his family constantly resided at the great manor lodge which stands in the Grand Park adjoining the town of Eltham.

Quoting from Mr. Gregory's charming book on Eltham, he says that at this time it is recorded that a long avenue called the Chase extended from the house towards Chislehurst, which centuries ago was used by King John of France as an exercising ground. The old roof has been stripped within living memory, and in place of the old red tiles and dormer windows the present roof of slates was substituted, and the chimneys improved. The two old turrets shown in an ancient drawing found in one of the upper rooms are gone, but the old walls and foundations are as strong as adamant, defying time and elements, and the building possesses many distinguishing features which recall the old days when it was built.

The room now used for billiards was the favourite sitting-room of the late owner, Mrs. Wood, who accidentally discovered the fine old tapestries on the wall when arranging to have the walls repapered. The tapestries represent part of a series of events in the reign of Ferdinand and Isabella of Spain, and in most of them the pomegranate is prominently shown, this being the emblem of Granada; and it is said that these tapestries were a gift to Sir John Shaw from Charles II., who had collected them during his wanderings. Mr. Guy



STAIRCASE, ELTHAM LODGE.

Laking, who specially examined this tapestry at the command of the King, gives the date as late sixteenth century and the workmanship as Flemish. The oak leaf, so well known as the symbol of Charles II., is represented in the mouldings of the room, and a quaint monogram of the name of the first owner, Sir John Shaw, is boldly carved on the huge fireplace.

The handsome old staircase, with its bold design and massive carving in the style perfected soon after by Grinling Gibbons, is an object which immediately chains the attention of the onlookers, and the immense oak beams across the ceilings of the lofty rooms are objects of admiration.

Sherard House, built 1634, is a most interesting old Jacobean dwelling in High Street, Eltham, and, as its name implies, is principally associated with Dr. James Sherard and his brother Dr. William Sherard, who came to reside here in 1718-9 after buying the house.

Here was originated that famous Herbarium, which finally contained, it is said, some 12,000 species of various plants that he had started collecting in the east, and which he afterwards bequeathed to the Botanical Gardens at Oxford and founded the botany professorship in the University.

James Sherard, M.D., was apprenticed in 1682 to Charles Watts, an apothecary, who was curator of the Botanical Gardens in Chelsea, and, although he worked hard in the practice of medicine, and made an ample fortune, it was the botanical arrangement and culture of plants that he delighted in during his leisure hours.

The principal work associated with him was the "Hortus Elthamensis," published 1732, in two large volumes, being the product of many years' earnest study, and this work was at this time the greatest authority on botany existing.

The house contains a very fine old staircase, and many of the rooms are panelled, although several have since been canvassed and papered over, all of which was pointed out and explained in a charming manner by the present owner, Mrs. Dobell.

MR. E. SEWARD *v.* THE CARDIFF CITY COUNCIL.

(Continued from last week.)

MR. MUIR MACKENZIE, High Court Official Referee, resumed, on December 15, the hearing of the action against the Corporation of Cardiff brought by Mr. Edwin Seward, F.R.I.B.A., and a member of the Royal Cambrian Academy, for the recovery of fees and damages in connection with the plans, &c., he had prepared as architect in connection with the Welsh National Museum at Cardiff.

In further cross-examination, Mr. Seward informed defendants' leader, Mr. Francis Williams, K.C., that if any of the plans he had prepared were tentative they were neatly finished. Unquestionably the object of tentative plans was to see whether they suited the views of clients, and in the case of the defendant Corporation that would apply. If the plans were not approved of, it did not follow that he would have to draw new ones, as he had often used rough plans when they were further developed and finished neatly. It would depend upon circumstances as to whether he would charge for plans he had submitted to a client that the latter did not approve of. It would depend upon the amount of work the client gave him to do, and which, if the client were not a business man, might go over months or years. Mr. Williams must permit him to get something for his work.

Mr. Williams: I suppose you know that the regulations of the R.I.B.A. allow five per cent. commission on the work executed by architects, including the preliminary specifications and sketches, approximate estimates, etc., so that all this would be included in the five per cent., supposing the work went on?—Yes; but this is for necessary work, and would not include unnecessary work.

In the course of further cross-examination, Mr. Seward persisted in his declaration that in 1905 it was recognised that the scheme would involve an expenditure of 150,000*l.* or 160,000*l.*

Does it not come to this, asked counsel: that there was some talk of what might be done in the distant future by way of covering the whole of the space, and that the sum of 150,000*l.* or 160,000*l.* was mentioned as the sum ultimately necessary when the space was covered?

Mr. Seward would not accept that view. He urged that his position as architect for the scheme, involving 150,000*l.* or 160,000*l.* was confirmed in reports presented to the Corporation, and that those reports supported and confirmed what was in the brochure, "Our Museum," in which the references to 150,000*l.* or 160,000*l.* appeared. He claimed that by the contract of 1901 between himself and the Corporation he was to be architect for a building to cost 150,000*l.* or 160,000*l.* That agreement did not limit the extent or nature of the building. He pledged his word that a plan showing an expenditure of 154,000*l.* was before the Committee on February 1, 1905. A statement was made at the Committee that the cost of the building scheme, as intended, would be about 150,000*l.* The plan submitted on February 1 afterwards went to the Treasury.

In further cross-examination, on December 16, Mr. Seward stated he had been naturally anxious that the museum should be located in Cardiff, and he thought he should have been the architect until the National Council called in other architects. Then, of course, his connection with it had gone. He had understood that he might still have a right to serve with the National Organisation. After he had received letters from Mr. Wheatley, the Town Clerk of Cardiff, he sent in his claim.

The re-examination of Mr. Seward was postponed.

Mr. Edwin T. Hall, of 54 Bedford Square, a Fellow and Member of the Council of the Royal Institute of British Architects, formerly Vice-President of that body, Fellow of the Royal San. Inst., and who has been practising in London for thirty-four years, said that he designed the St. Ermyn's

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Hotel in Westminster; the head office of the Metropolitan Asylums Board, on the Thames Embankment, the Manchester Royal Infirmary, and other important buildings. With Sir Aston Webb and Mr. J. J. Burnet, witness adjudicated on the plans for the Welsh National Museum. The contemplated outlay on the first or southern portion of the museum represented 80,000*l.*, whilst the completed scheme would have involved about a quarter of a million. Witness and another London architect had inspected the plans produced as being the plans prepared by the plaintiff in connection with the various parts of the Museum. Those plans indicated the general "lay-out" of the scheme. Mr. Hall dealt in detail with the various plans prepared in connection with the different sets by Mr. Seward, and said that he considered these were quite satisfactory and that all of them were necessary, as they had relation to each other, certain ones being important developments of the others. In his opinion 1¼ per cent. at least would be a proper fee for services in connection with plans prepared by Mr. Seward on an outlay of 30,000*l.*, one part of the scheme, and Mr. Seward would be therefore entitled to 375*l.* He arrived at that figure by general experience as an expert and a professional man. In the printed regulations for competitions at the Royal Institute it was one of the regulations that if the works were not proceeded with the architect should be paid remuneration at 1¼ per cent. on the estimate. That was a very general thing in all big competitions. In certain of the plans, the witness continued, there were a great many important variations that Mr. Seward evidently had found it necessary to make. Fresh plans, for example, would be necessary if instructions were given that levels were to be altered. Certain drawings in relation to one scheme were much more extensive than the first set. They showed construction in great detail, and they were all but working drawings. The second set of plans Mr. Hall described as a set of drawings for a building, the portion of a larger building and lay-out. Witness held that all the fees charged by Mr. Seward were fair and reasonable, and in accordance with the custom of the profession.

In cross-examination by Mr. F. Williams, K.C., the witness repudiated the idea that there were no essential differences between the schemes. It was not true that no charges would be made in the case of a few trifling alterations. But in this case there were radical alterations involving fresh plans. In his view the changes were sufficiently radical to justify the charges Mr. Seward made.

Counsel: Do you say, then, that where there is a radical change, then there is a fresh charge?—No; there may be radical and semi-radical changes, in which development it becomes a new scheme; yet the bulk of a large part of it comes into the second scheme.

Counsel: Do you charge for tentative plans?—Not if the alterations are very trifling; but no one can say that these are tentative plans.

Mr. Williams: I suggest that as a result the whole amount due to Mr. Seward in respect of Cathays Park on 30,000*l.* is 2½ per cent., and that ought to cover the lot.—Of course I do not agree with that.

Answering another question, he said that plaintiff's plans were very elaborate. If some of them were in pencil, that made no matter; the brains were there.

In re-examination by Mr. Vaughan Williams (for the plaintiff), the witness said that if subsequent drawings were but copies of the block plan, there would be no necessity for the architect to continue; but a block plan did not help the development and completion of a scheme.

Mr. Henry Vaughan Lanchester, F.R.I.B.A., and a member of the Council of that body, and of the firm of Messrs. Lanchester and Rickards, of Bedford Square, stated that his firm were the architects for the Law Courts and City Hall of Cardiff, they being selected by a jury of assessors. Their services were also requisitioned in connection with the new Wesleyan buildings at Westminster. Mr. Lanchester said he agreed with the evidence of Mr. Hall as to the fairness of the charges made by Mr. Seward as architect for the Museum scheme in Cardiff.

Mr. Seward, in re-examination, said he had prepared three different sets of plans since the 1901 agreement. The first set of plans covered the index hall, as well as other buildings. In the first set the index hall was to be built a considerable number of feet below the level. The level of the index hall was regarded as an important feature of these plans. In the second set of plans the index hall was only 2 feet below the nominal level, and that was a very important alteration. There were also changes concerning a staircase in the second set. Then there were variations in the area of the front—10 feet each end. The chief changes in the third set of plans had to do with the question of economy arising from the reduction of expenditure.

The plaintiff said that the particulars he gave in the action were delivered on July 20 this year, and they were prepared from his instructions. At the time he prepared his particulars he had not got the minutes of the committees as they had them now. At the time in question he had to go to the Cardiff Free Library—the only place available—to get such minutes as he could find—sometimes he had no success, because the more recent minutes at the Free Library were not bound. For those reasons he had to admit that his particulars were incorrect.

Mr. Max Clarke, F.R.I.B.A., and a member of the Council and of the Practice Committee of that organisation, and of Messrs. Max Clarke & Garbutt, architects, of 4 Queen Square, Bloomsbury, was also called to give evidence as to the fairness of Mr. Seward's charges. Mr. Clarke, who said he had considerable experience, assessed the sum to which Mr. Seward was entitled for the first set of drawings and plans at 375*l.*, which would, he said, be at the rate of 1¼ per cent., which seemed very reasonable for drawings brought to such a stage of development as these were. Witness thought that plaintiff was entitled to a further sum of 450*l.*, or 1½ per cent., on the further set of plans and drawings submitted in 1903. He certainly thought that plaintiff was entitled to the remuneration he claimed, having regard to the developments that had taken place.

Cross-examined by Mr. Francis Williams, K.C., the witness said that his evidence concerning the charges was based on the idea that there was a 150,000*l.* scheme, and that 30,000*l.* was merely a part of it.

Mr. Williams: I put it to you that the set of plans and designs for which you give 450*l.* are merely developments of those for which you allocate 375*l.*?—Developments to a certain extent, but they occasion an entirely separate set of drawings.

I suggest, too, that there were no serious modifications of the plan, and that it was merely working out the first plan?—I think there were serious modifications. Witness, however, did not agree with Mr. Hall and Mr. Lanchester quite as to the extent on which remuneration should be allowed as between the first and second set of plans. He considered that the third set was an entirely new set of plans.

Mr. Williams: The third set of plans must be the result of labour expended on the first and second?—A very small portion of it.

I suggest to you that the whole thing is one scheme—that it is a development of one scheme, and that there ought not to be charges for separate sets of plans?—I cannot agree with you.

Mr. Thomas M. Deacon, F.S.I., a quantity surveyor, practising at Craven Street, Strand, stated that he was called upon to advise the assessors in connection with the plans for the Welsh National Museum. He found the cubical contents would be about 3,064,594, and he reckoned the total cost at about 153,983*l.* He calculated on the basis of 9*d.* a foot for the basement and 1*s.* a foot for the superstructure. In his opinion it was a fair basis to go on in making a valuation.

At the close of the plaintiff's case Mr. F. Williams said he would defer his observations and call his evidence at once.

Mr. John Ward, who was appointed curator to the Cardiff Museum in 1893, stated, in answer to Mr. Sankey, K.C. (for the defendants), that there was no truth in the plaintiff's statement of claim that the plans of October 1895 were abandoned, and a fresh set ordered at the meeting on February 7, 1896. The scheme was modified and developed from time to time.

Mr. Sankey stated that Mr. Seward had produced some plans of 1902, and had alleged that Mr. Ward's plans had shown no Index Hall.

Mr. Ward said that the Index Hall was in his plans. It was unique. In fact, it was the crowning glory of his plans. He had had many plans and drawings relating to the Index Hall before that time. The Index Hall was a device to apply to the Natural History section, which would take in zoology and botany. Witness was of opinion that the alteration of the levels of the Index Hall would not materially affect the plaintiff's plans. Mr. Ward was taken in great detail through the many plans by Mr. Sankey, with the object of traversing the statements of plaintiff and his expert witnesses that the work had concerned different schemes.

On December 20 Mr. Ward, in cross-examination by Mr. E. Pollock (for the plaintiff), said that there were three sets of plans, but he considered they related to one scheme.

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Asked if he meant that Mr. Seward ought only to be paid for one set of plans, the witness replied he should not like to say "Yes" or "No."

Mr. Pollock: You do not know whether the plaintiff ought to be paid independently for each of these plans, whether you call them tentative working plans or working plans developed?—I should say "No."

What is your opinion based on?—I am not making any suggestion as to what he ought to be paid.

If the architect is to be paid only for such plans as will carry out a 20,000*l.* scheme why had he to draw the elevation you see behind the Referee?—Simply because the first building would require an elevation.

Is he to be paid for the elevation?—I take it he is to be paid according to the terms, which will include the elevation of plans.

What those terms are you do not know?—No.

Does it not make a difference when details are hammered out before the committee for four or five years?—They may have been hammered out, but there were long intervals, and I do not think it was more than four years.

Regarding an allegation that specifications were not in existence at the time of a meeting on February 3, 1905, Mr. Pollock asked the witness to account for a reference in the minutes of a meeting of the committee of that date to specifications submitted. Mr. Ward said that must have been a slip of the pen. As far as he could remember only estimates were in existence then.

Mr. Alderman Iltyd Thomas, an ex-Lord Mayor of Cardiff and chairman of the Museum committee, stated that he regarded these sets of plans as plans relating to one scheme. He added the central block was shown in every plan, the west wing was in every plan, the west pavilion was in every plan, and the Index Hall was in every plan except one. Witness was an estate architect and surveyor. From his experience he would declare that all these plans related to one scheme. In the early part of 1905 it was never contemplated to build a 150,000*l.* building.

Mr. E. Pollock (cross-examining): You understand that the Cathays Park scheme was a larger scheme than anything that had been proposed at Park Place?—Our outlay was restricted by the extent of our funds.

Mr. Pollock: Was it not clear to your mind that the Gridiron block plan, prepared by Mr. Seward, and which I am now touching, involved the outlay of a very large sum of money?—No, we touched the principle only.

Mr. Pollock: That is not answering my question. You are making an argumentative statement. Was it not quite clear to your mind that this Gridiron block plan entailed an expenditure of a very large sum of money?—Witness: If carried out.

If carried out this Gridiron block plan involved the expenditure of a large sum of money?—Yes.

What do you say would have been the minimum for which you could carry out this scheme indicated upon this plan with the section showing the staircase and so on?—150,000*l.* is the minimum.

You wanted the Museum to be worthy of Wales?—It was only municipal then.

Mr. Pollock: Let me drop out Wales. I thought Cardiff was a very distinguished town in Wales. I put it to you that for the purpose of making the commencement of a building on that principle it would be necessary for the architect to consider everything as a whole?—No.

It was obvious from the start, was it not, that you would endeavour to secure voluntary subscriptions to assist you in the building?—Yes.

The more attractive the scheme the more likely you were to get subscriptions?—Yes.

Would it be possible for an architect to direct his mind on a scheme involving 30,000*l.* without considering the plans in relation to the scheme as a whole?—Yes.

Was it an important matter that this building should compare favourably with municipal buildings adjacent?—Yes. In further cross-examination Mr. Thomas thought that a long and laborious study devolved upon the members of the Museum Committee rather than the architect.

Mr. Pollock: Do you mean to say that Mr. Seward was doing comparatively little while the Committee was expending a long and laborious time over the plans?—I mean that the brain power was shown by the hon. curators and the committee. The other part was draughtsmanship.

Do you suggest it was never intended to pass these plans over for adoption by the National Museum of Wales?—I say it was never intended by the National Museum people or by the Corporation that these plans should be adopted for National Museum purposes. The National Museum intended to have a vastly greater scheme. Witness, however, admitted these plans might be useful for the National Museum of Wales. He added that they had since accepted a design in competition, and that they had trial holes dug.

(*To be continued.*)

ILLUSTRATIONS.

REREDOS, ST. MICHAEL'S, BRIGHTON.

THIS sumptuous piece of ecclesiastical furniture was carried out from the designs of Mr. W. H. Romaine Walker.

GARDEN FRONT TO A LONDON RESIDENCE.

THIS front was the outcome of the complete remodelling and enlargement of an existing house of very plain nineteenth-century type, the garden front being entirely removed and rebuilt. The ground sloped somewhat rapidly, and two fine reception-rooms were formed on the ground-floor, with arched entrance from both to the garden; the dining-room was panelled in mahogany, and the drawing-room in white, with parquet flooring and enriched ceilings to both rooms. An oak panelled billiard-room was constructed at the garden level, with solid oak floor and beamed ceiling. A music-room was also added on the upper floor with barrel ceiling and recessed end, which has proved very successful acoustically. The architect was Mr. Arthur J. Gale, F.R.I.B.A., F.S.I., of 4 Serjeants' Inn, Temple, E.C.

HOUSE AT FOREST ROW, SUSSEX.

THIS house has been erected on the borders of Ashdown Forest, and adjoining the Forest Golf Links. It has been built with local materials, and, standing on an eminence, makes a fine skyline. The cost worked out at 5½*d.* per foot cube. The architect was Mr. Arthur J. Gale, F.R.I.B.A., F.S.I., of 4 Serjeants' Inn, Temple, E.C.

INTERNATIONAL CORRESPONDENCE SCHOOLS, KINGSWAY, LONDON.

THIS notable example of London street architecture is one of the buildings that will make Kingsway a museum of Modern English architecture. The architects were Messrs. Gordon & Gunton.

BASE OF PULPIT, MOSQUE OF OMAR, JERUSALEM.

IN this drawing by Mr. Henry G. Webb we have shown one of the lofty pulpits common in Moslem religious buildings, and standing on the east side of the broad flight of steps leading up to the Temple platform or sacred enclosure.

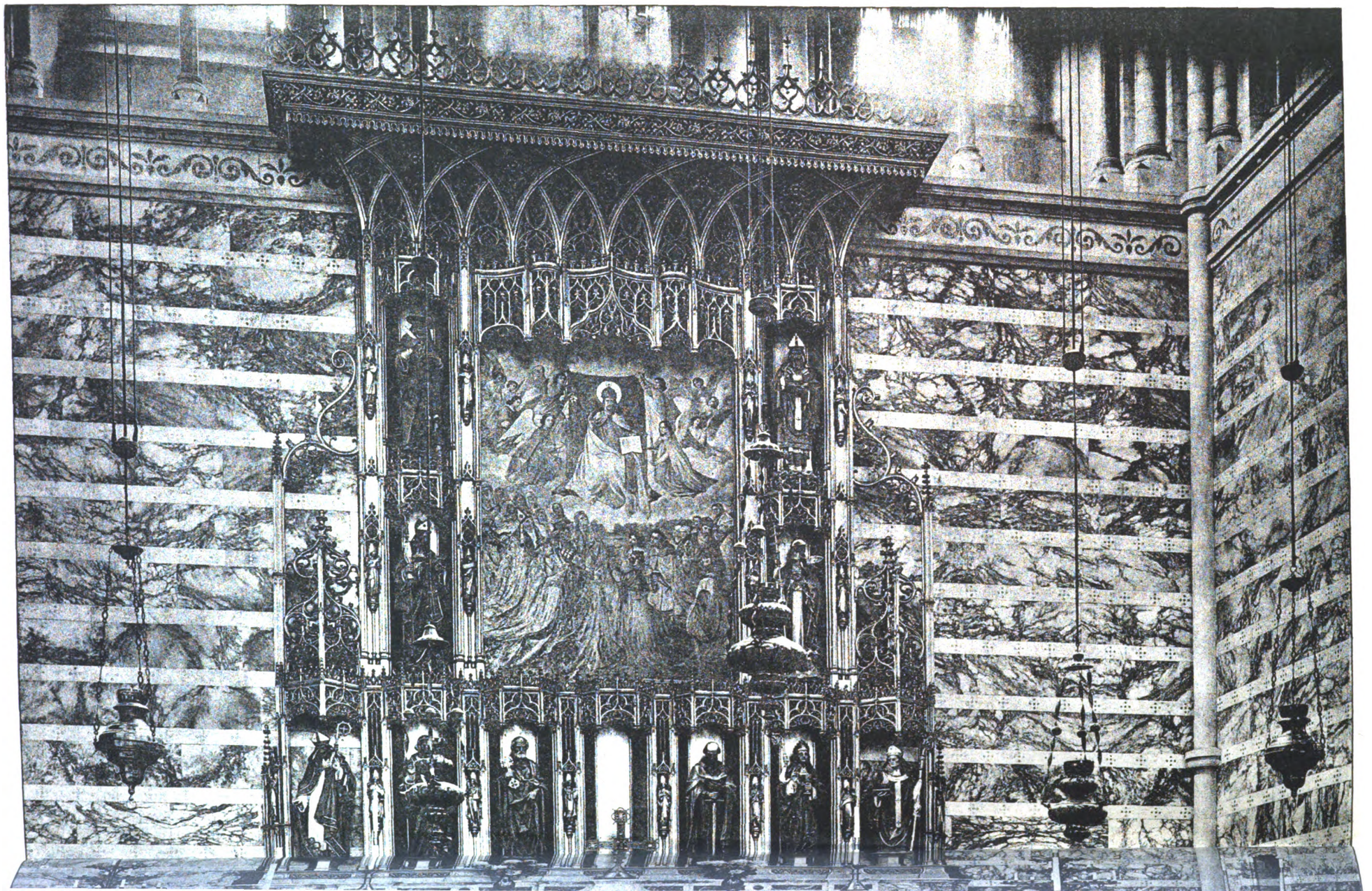
Mr. J. W. Winter, architect, St. Peter's Close, Sheffield, has been awarded first place in a competition for a proposed Baptist church at Langley Mill. The cost of the scheme is estimated at 2,000*l.*

The Abingdon *Parish Magazine* mentions that some improvements have lately been made in St. Helen's Church. Owing to the moving of a tablet, an old doorway leading to the Exchequer Chamber was brought to light. It has now been uncovered completely, and is an historical feature in the church. Also the old west doors have been cleaned and restored to their original position, while the other doors have been cleaned. Few churches, it is claimed, can show such a number of handsome and ancient doors as St. Helen's now possesses.

Important extensions to the Applied Science Department of the Sheffield University are in contemplation. The Department of Mining is to be enlarged, and a new department of non-ferrous metallurgy created. In all the sum of 16,000*l.* will be spent on buildings and equipment.

It was reported to the Surrey Education Committee that the Board of Education now insists that in new schools, instead of a central hall with class-rooms opening out of it, the hall must either be detached entirely or must have corridors separating it from the class-rooms. The committee was of opinion that this was not an improvement upon the existing style of building, and as it will add 1*l.* a head to the cost of the schools the right of the Board of Education to insist upon this further burden on the ratepayers is to be called in question.

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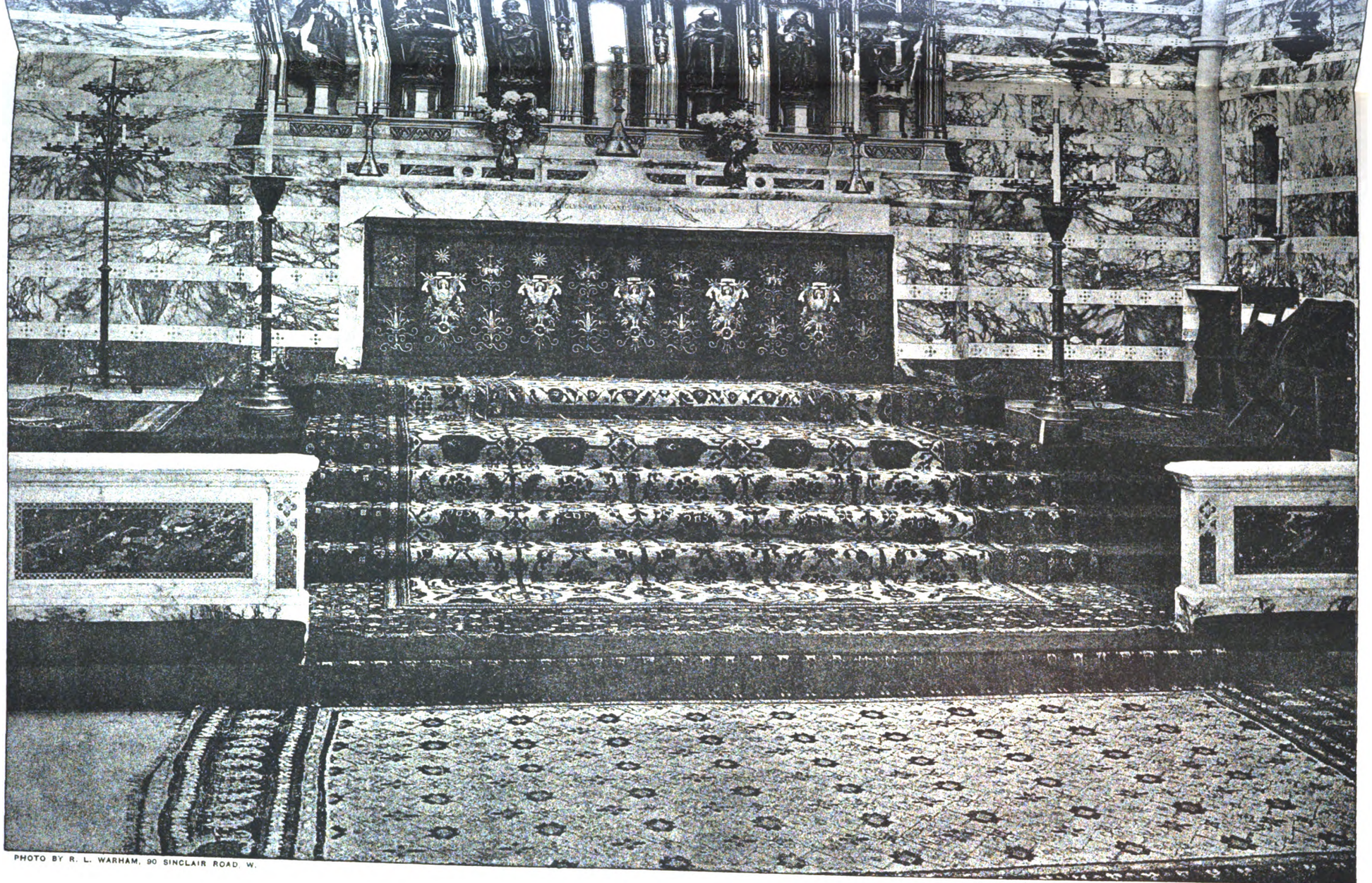


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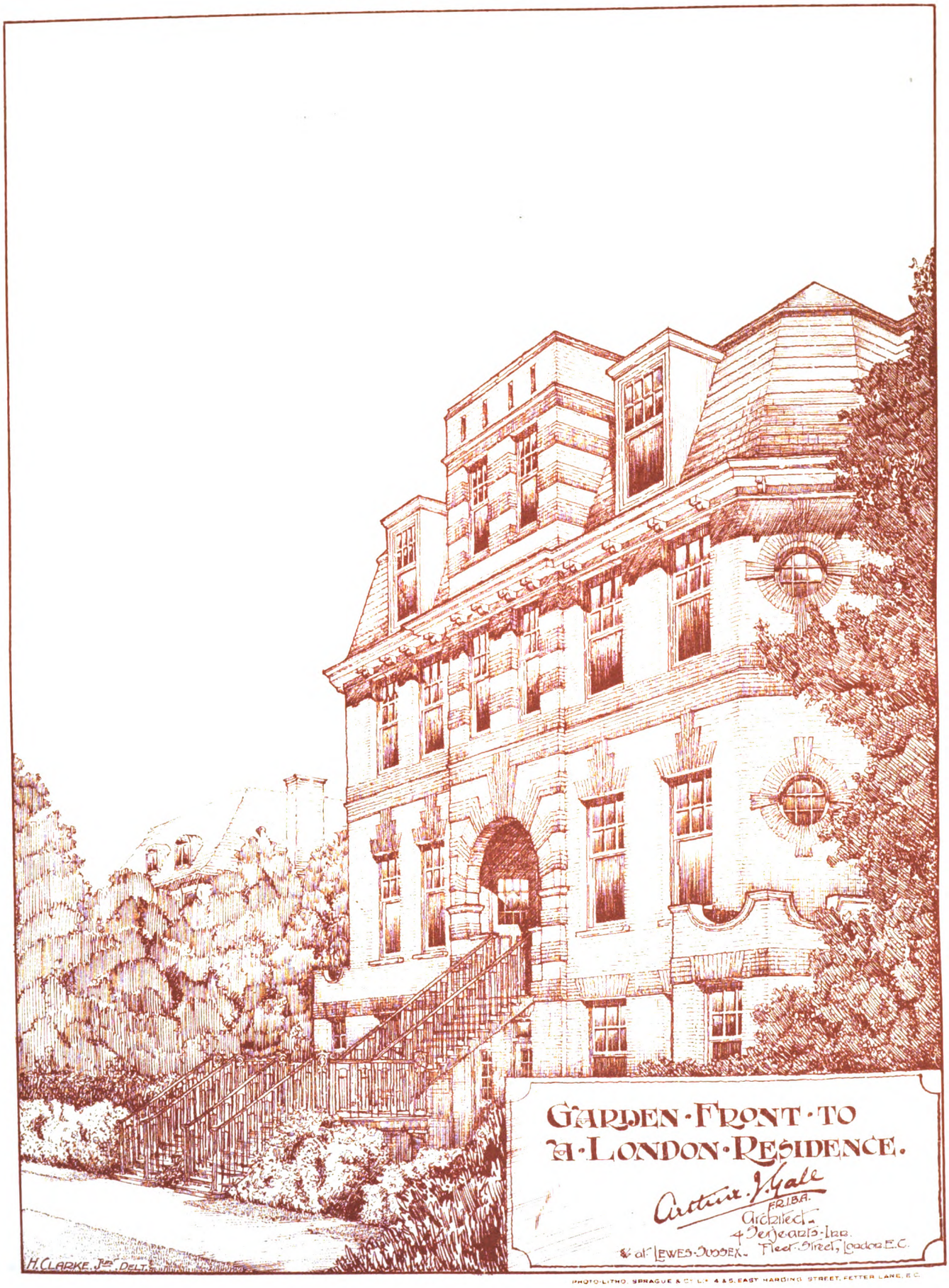
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Mr. ROMAINE WALKER, Architect.

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GARDEN · FRONT · TO
A · LONDON · RESIDENCE.

Arthur J. Gale
F.R.I.B.A.
Architect.
4 Serjeants' Inn.
Fleet Street, London E.C.
& at LEWES · SUSSEX.

H. CLARKE, Jr. DELT.

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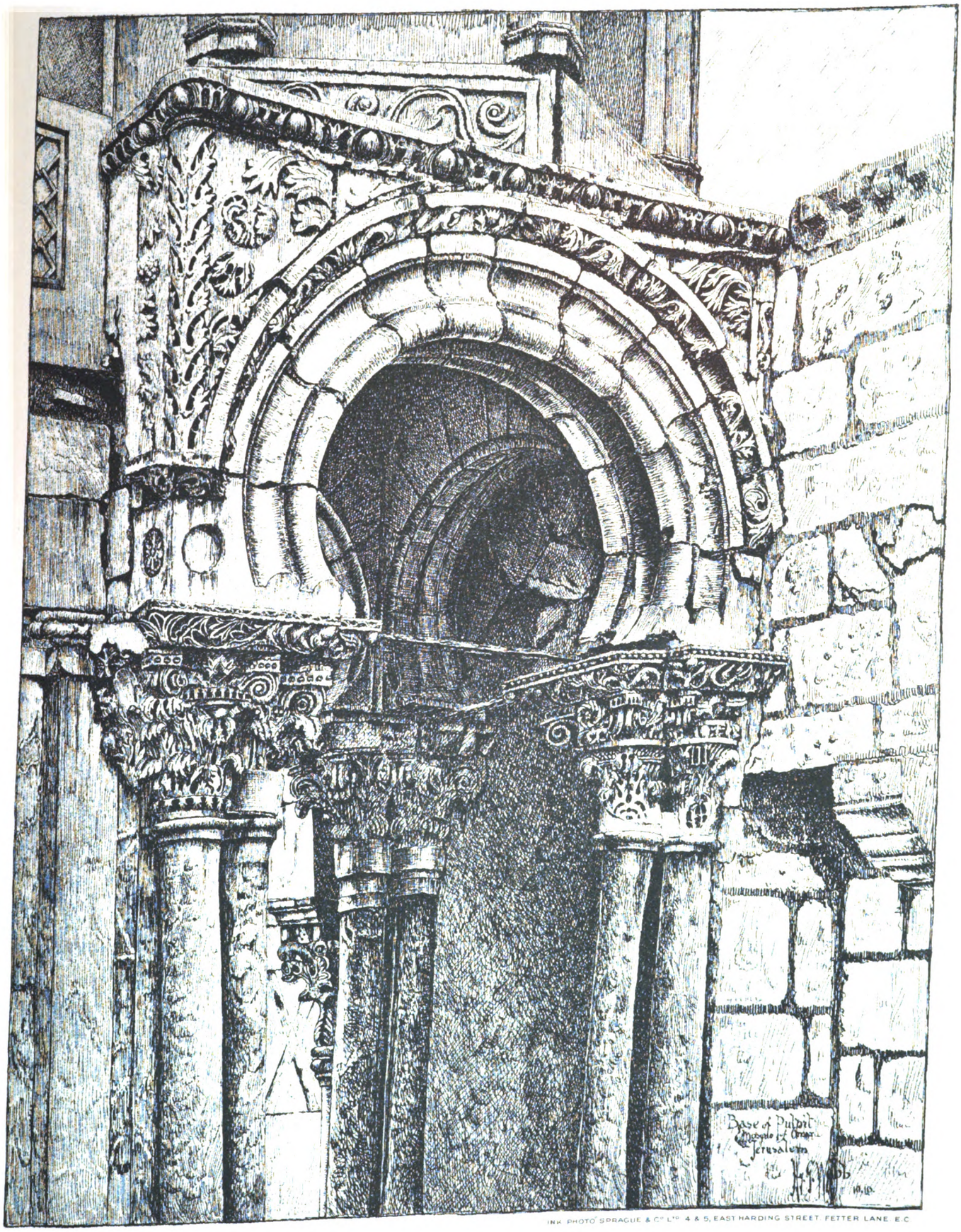
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BASE OF PULPIT. MOSQUE OF OMAR, JERUSALEM

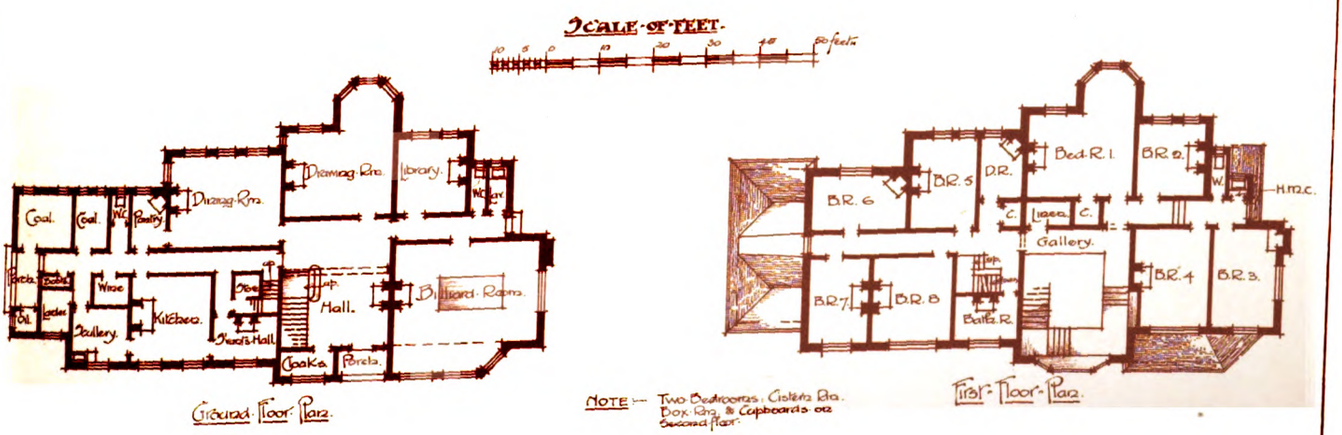
From a DRAWING by Mr. HENRY G. WEBB

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HOUSE AT FOREST ROW, SUSSEX.



NOTE:— Two Bedrooms, Cistern Rm. Box Rm. & Cupboards on Second Floor.

Arthur J. Gale. F.R.I.B.A.
Architect.

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MODERN COLD STORAGE AND REFRIGERATION.

By W. S. DOUGLAS, B.Sc.

(Concluded.)

XXIV.—MOTIVE POWER FOR REFRIGERATING PLANT.

TO drive the compressor and various auxiliaries in connection with the refrigerating machine power must be supplied from an external source, although what form this will take and how much will be required are questions which we have not hitherto discussed. The presence of some form of motive agent has always been tacitly assumed or briefly referred to, but it was considered best to leave the investigation of its nature to a separate section.

The principal absorbent of power is the compressor. Beside this the auxiliaries which require driving are, in cold storage plants, the brine circulating pump (if direct expansion is not used), the water circulating pump for the atmospheric condensers, and the fans for the cold stores; in ice-making plants, the brine propeller, condensing water pump, and either mechanical agitators or air compressors, or water pump for the exhaust steam distilling plant.

The power taken by the compressor, which is perhaps 95 per cent. of the whole in cold storage work, varies considerably with the working temperatures. Low temperatures in the cold store, ice-making tank, or other place where refrigeration is applied, correspond to low pressures on the suction side, and similarly high temperature cooling water spells a high condensing pressure on the delivery side. Both of these conditions therefore cause the compressor to take more power, since each increases the pressure difference on which the power consumption naturally depends.

By regarding the machine as a "heat pump" this may be more clearly understood. Its function is to pump heat from a low temperature level (in the evaporator, cold store, &c.) to a high temperature level (in the condenser), just as an ordinary pump lifts water from one level to another. In both cases the larger the quantity which is raised, and the greater the difference of level through which it is lifted, the higher is the consumption of power. Moreover, the theoretical calculations are exactly similar in each case, if we substitute for heat a quantity known as "entropy."

From this we see that a statement of the power consumed by a machine is never complete unless at the same time the temperature limits between which it works are specified. Even then there is room for doubt, unless it is made clear that the figure given refers to "brake" horse-power and not to "indicated" or to theoretical. In the last-named no account is taken of the power absorbed by opening of the compressor valves, by friction in valve passages and pipes, or by leakages, and a perfect "adiabatic" compression is assumed. Indicated power is a practical figure, and allows for all these losses, but not for mechanical friction. It is measured from the compressor cylinder by means of an indicator, an instrument which registers automatically the pressures at all points of the stroke. But brake horse-power allows for everything, and represents the actual power which must be provided to drive the compressor. The difference between it and the indicated horse-power is exactly equal to the power absorbed by friction in the mechanism.

Another factor which affects the power taken is the area of the condensing and evaporating surfaces. The greater these are in proportion to the capacity of the machine the less will be the power absorbed. This is because a large surface area means that the heat can be transmitted more easily. Consequently the difference in temperature on the two sides of the surface which is required to effect the transmission is less, and the pressure, in the case of the condenser, will be lower for a given temperature of cooling water. Similarly in the case of the evaporator, at a stated brine temperature it will be higher, thus reducing the pressure difference at both ends.

Hence anyone buying a machine should be careful to see that the condensing and evaporating surfaces are of ample area. The larger they are, naturally the greater the cost to the purchaser; but for this he will be amply recompensed by reduced running charges. A good average figure for brine tank evaporators and submerged condensers is 100 feet of 1¼-inch pipe per ton refrigeration in twenty-four hours. In atmospheric condensers 25 per cent. more should be allowed.

As far as the actual power is concerned, however, the purchaser will be quite safe if he states the temperature of his cooling water and the temperature of his stores, and also asks what is the brake horse-power he must provide. Safe figures under English conditions are as follows:—

Machines up to 10 tons capacity	1.75 B.H.P. per ton refrigeration. (2 in the smaller sizes)
,, ,, 50 ,, ,, ...	1.5 ,, ,,
,, above 50 ,, ,, ...	1.5 to 1.3 ,,

Very often the actual power consumption is considerably lower than that calculated from these figures, and it varies slightly, we have seen, with different refrigerants. Workmanship also enters considerably into the question; but, on the whole, the above data may be taken as giving safe average results for sulphur dioxide or ammonia. For carbon dioxide machines, values some 8 to 10 per cent. higher must be allowed.

Various Forms of Power.

Steam.—The steam engine is the oldest, and, although not always the most economical, is the most widely understood form of motive power we have. At sea, where everything is steam driven, it is used to the exclusion of any other type for driving freezing machines. It is also employed on land very widely for large plants; but owing to various advantages obtained with other forms of power, it has lost favour to a large extent in the smaller sizes, unless where steam is generated for other purposes.

Where a steam plant is put down specially to drive the compressor and auxiliaries, it will include in the small sizes (say up to 20 B.H.P.) a vertical cross-tube boiler, steam engine, either vertical or horizontal, according to size and space available, and a feed-pump or injector. The latter are for the purpose of feeding water into the boiler against the pressure at which steam is generated, and of the two the injector is considerably the cheaper. It consists of an arrangement of nozzles whereby steam coming from the top of the boiler condenses and draws in water by suction, and then discharges itself as water, together with the water it has entrained, into the boiler against the pressure existing. The pump is composed of steam and water cylinders; the steam piston and water plunger being on the same rod (direct driven steam type). Boiler steam is admitted to the steam end, and water is pumped into the boiler by the water end.

The following figures would apply to a plant of 10 B.H.P. capacity, assuming 80 lbs. boiler pressure:—

Lbs. of steam generated per lb. of good Midland coal	= 7.5
Lbs. of steam consumed per B.H.P. hour by the engine and feed-pump (non-condensing) ...	= 40.0
Lbs. of coal per B.H.P. hour	= 5.33
Cost per B.H.P. hour as 17*s.* 6*d.* per ton ...	= 0.5 pence

A B.H.P. hour is, of course, the amount of energy given out by one B.H.P. acting continuously for one hour. In that space of time ten B.H.P. hours would be given out by this engine.

In larger plants a condenser would be added to give increased economy by condensing the steam through the agency of cold circulating water, so that a vacuum is formed behind the steam engine piston, giving great difference of pressure, and consequently more power for the same quantity of steam. Condensers may be of the surface, surface evaporative, jet or injector types, and with all except the last-named an air pump is required to extract the air (which would otherwise spoil the vacuum) and pump the condensed water into the hot well against atmospheric pressure. Sometimes, but rarely, these two operations are performed by separate pumps, and, in addition, a circulating pump is usually required for the condensing water.

The boiler will now be of the horizontal Lancashire or Cornish type, or it may be either "water tube" or "dry-back." The latter are easy to set, and, with automatic chain grate stoking, are very efficient (75 per cent. to 80 per cent. for the water tube and 70 per cent. to 75 per cent. for the dryback, as compared with 65 per cent. to 70 per cent. for Lancashire boilers). For the utmost economy with a Lancashire boiler (which is the simplest and most easy to clean of those we have mentioned) an economiser and super-heater should be fitted. The former is for the purpose of heating the feed-water by contact with the flue gases, and the latter for heating the steam above the temperature of boiling. By the first-named, heat which would otherwise be wasted in the chimney is saved, and by the super-heater the steam consumption of the engine is reduced. Both consist of pipe grids, and are located in the path of the flue gases, the superheater at the point where they leave the boiler and the economiser just afterwards.

Instead of having one cylinder, the engine will now have two, being of the compound type. The steam passes through both cylinders in succession, and gives up a part of its energy

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in each. It will also, since compressors of large size run at slow speeds, be of the "drop valve" or "Corliss" pattern, and may be direct coupled to the shaft of the compressor, by the makers of which it is frequently supplied. For superheated steam various special points must be embodied in its design. The parts of the installation therefore are: boiler, economiser, superheater, feed-pump, compound engine, condenser, air pump, circulating pump. Average figures applicable to a 200 B.H.P. set at 150 lbs. boiler pressure are as follows:—

		With Economiser and Superheat of 120 deg. F.
Lbs. of steam evaporated per lb. of coal	8.5	9.2
Steam consumed per B.H.P. hour by engine and auxiliaries	23.0 lbs.	19.0
Lbs. of coal per B.H.P. hour	2.71	2.06
Cost at 17*s.* 6*d.* per ton	0.25*d.*	0.19*d.*

Even better figures than this can be obtained, and makers will readily guarantee 400 B.H.P. engines working with superheated steam to consume only 14 lbs. of steam per B.H.P. hour (excluding auxiliaries).

Gas.—Gas engines, since the advent of the suction gas plant, have, except in the larger sizes, been steadily displacing steam, owing to their superior economy and lower cost. The suction gas plant consists of various pieces of apparatus wherein steam and air, driven over incandescent coke or anthracite coal by the suction of the engine, are turned into a mixture of combustible gases, which, by cleansing, are made suitable for feeding the engine. The gases are of poor quality, but owing to the cheapness of production are very economical.

It is cheaper, however, in small engines to use coal gas taken from the town mains, and then there is little difference in running economy between gas and steam. A 10 B.H.P. engine would consume 20 cubic feet per B.H.P. hour, with a calorific value of 600 B.T.U.'s per cubic foot, which, at 2*s.* per 1,000 cubic feet, means 0.48*d.* per B.H.P. hour.

A 200 B.H.P. plant, running in suction gas, would use in the suction gas-producer 0.8 lbs. of anthracite coal per B.H.P. hour. Anthracite coal costing 25*s.* per ton, this means a running cost per B.H.P. hour of 0.11*d.*

Electrical.—The cleanest and the least troublesome, but at the same time the least economical method of all, is the drive by electric motor. No trouble is experienced in starting up, and very little attention is required when running, as compared with any other form of power. The first cost is also extremely low, and the floor space taken up far less than with gas and steam plant. But since electrical power has first to be generated, then to be transmitted, and finally to be converted into mechanical energy by the motor, many losses occur, and the running charges are high.

Motors must be arranged to suit the local electric current and supply. This may vary in voltage from 100 to 460, and may be either alternating or continuous. Many forms of alternate current motors are on the market, but continuous machines for refrigerating work are all of the shunt-wound pattern. In addition to the motor, all that is necessary is a starter and concrete foundation, with adjustable bedplate to take up the belt stretch.

A 10 B.H.P. machine, running at 1,000 r.p.m., would consume about one Board of Trade unit per B.H.P. hour, costing 1*d.* With a 200 H.P. machine (a motor of this size would only rarely be used for refrigerating work) the consumption would be 0.8 units, costing 0.8*d.*

Oil.—Oil engines are used in country places where no gas or electricity is available, and where the user does not care for the trouble of steam. Only smaller sizes are put in.

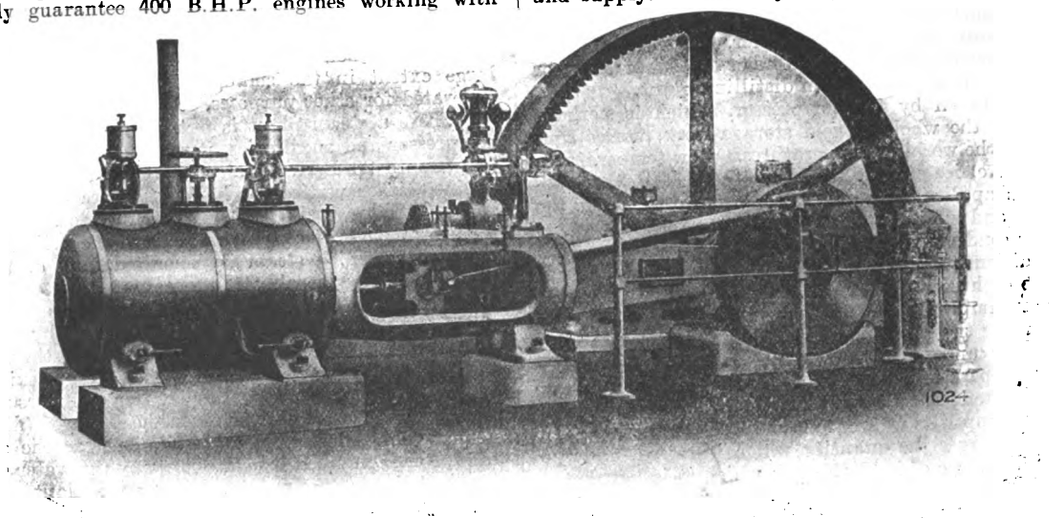


FIG. 78.—A MODERN HORIZONTAL DROP VALVE STEAM ENGINE (MARSHALL).

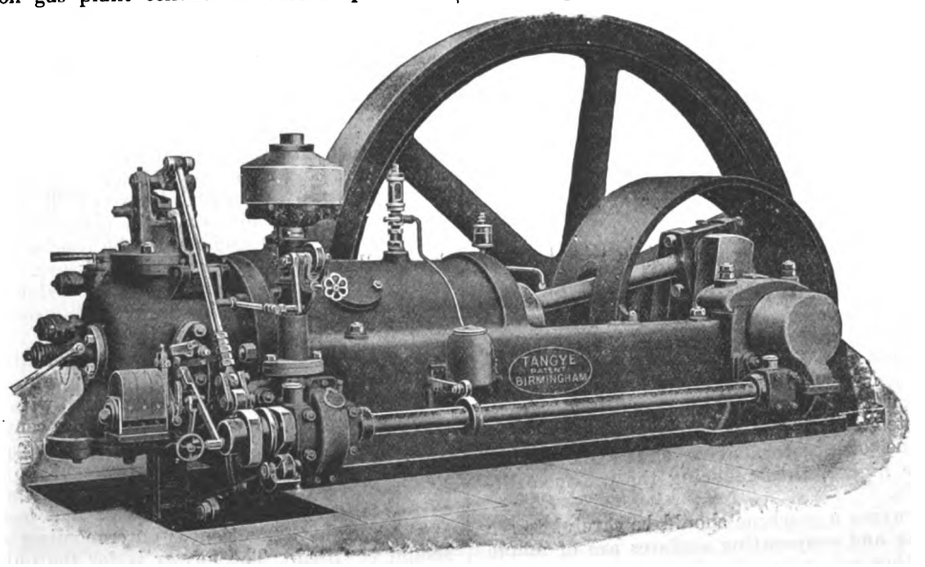


FIG. 79.—A MODERN HORIZONTAL GAS ENGINE

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A 10 B.H.P. engine would consume 0.8 pints of oil per B.H.P. hour, costing 6*d.* per gallon, which gives a cost per B.H.P. hour of 0.6*d.*

Mention must also be made of the Diesel engine, which, by reason of its close approach to the theoretical cycle demanded of heat motors for perfection, is claimed to be the most economical engine in existence. Its first cost, however, is high in the small sizes, and it cannot be trusted to unskilled attendants. The consumption per B.H.P. hour for a 10 B.H.P. engine is 0.54 lbs. of crude petroleum, costing 40*s.* per ton, which gives a cost per B.H.P. hour of 0.12*d.* For a 200 B.H.P. engine the consumption would be 0.44 lbs. and the cost 0.09*d.*

Water.—Wherever water is available water power should be used either through a turbine or a Pelton wheel, as the cost of fuel is nothing, and the motor itself is not unreasonably expensive. Unfortunately, however, it is very seldom that a suitable supply can be obtained.

We are now in a position to compare the forms of power which we have discussed, and, to effect the comparison, the following table has been made up. It includes the cost of a B.H.P. hour, and also the initial outlay necessary in each case (for the London district). No account is taken in the latter of foundations, but in the case of the large steam plants, chimneys, and boiler seatings are allowed for:—

Form of Power.	Cost per B.H.P. Hour in Pence.		Approximate Cost of Plant Erected in London.		Fuel Cost Basis.
	10 B.H.P. Size.	200 B.H.P.	10 B.H.P.	20 0B.H.P.	
			£	£	
Steam . . .	0.50	0.25	120	1,630	17*s.* 6*d.* per ton
Do. with superheater and economiser .	—	0.19	—	1,750	17*s.* 6*d.* per ton
Gas engine using town's gas . .	0.48	—	75	—	2*s.* per 1,000 cubic feet
Gas engine and producer plant . .	—	0.11	—	1,500	25*s.* per ton
Electric motor (direct current) .	1.00	0.80	40	410	1*d.* per unit
Oil engine . .	0.60	—	110	—	6*d.* per pint
Diesel engine . .	0.12	0.09	200	1,600	40*s.* per ton

Comparison.—Voluminous treatises have been, and are appearing in support of each of these various forms of power, and much more could be written in the endeavour to form an impartial judgment between them. But the attempt, however conscientious, could scarcely end in success, since so much depends on individual conditions.

The Diesel engine, it will be noticed, is the most economical of any, water, of course, excepted, in both sizes, thus forming a triumphant vindication of the theory man and his ways. But in the smaller size it is expensive—so much so as to be prohibitive. Electric motors are always the cheapest, but are unfortunately the most wasteful; while gas and steam in the larger sizes approach each other very closely for first cost, although the running charges for the steam engine are higher.

As a rough-and-ready rule we would recommend that in the smaller size, owing to the floor space, initial expense and attendance required, the steam engine should be installed only where boilers are already in existence, or where steam is required for other purposes, as in dairies; that gas engines, owing to the frequent necessity for cleaning, tendency to noise and dirt that is liable to collect, should be used only when local conditions give them a pronounced superiority in economy; that motors, owing to their cleanliness, silence, and compactness, should always be used, unless unduly high running costs under local supply rates prohibit their employment; that oil engines should be put in only where necessity compels, as in country places; and finally, that water power should be employed wherever available.

In the larger size comparison is even more difficult. Only a few years ago steam would without hesitation have been given the preference; but now suction gas and the Diesel engine have both made such rapid advances that no sweeping generalisation can be permitted. Undoubtedly steam is still the more certain and reliable of the three, because of the long experience which engineers have had in manipulating it, but the others in this respect can now almost claim equality.

It is at or near this particular size, too, that the discussion is keenest. For intermediate horse-powers, Diesel engines and suction-gas plants can be confidently recommended, and in larger installations one would declare with equally certain voice for steam. But at or about 200 h.-p. the only conclusion we can come to in a general and too brief discussion such as this is that each case must be treated on its own merits.

Finally, it must be borne in mind that the table we have given applies only to London. It has been made up from a careful study of the figures supplied by a large number of makers, and from a comparison of these with the result of well-known engine trials. As far as London is concerned, it may therefore be taken as accurate; but in other towns it would have to be altered, since in no two places are the cost bases identical, or even in the same proportion.

THE SOCIETY OF ARCHITECTS.

A WELL-ATTENDED meeting of the Society of Architects was held on Thursday, December 15, at their premises in Bedford Square, Mr. Geo. E. Bond, J.P., president, in the chair. After some preliminary business, Mr. G. A. T. Middleton, A.R.I.B.A., M.S.A., past Vice-President, read a paper on

A Great London Improvement Scheme.

The problem of the improvement of London is one which has been claiming more attention every year for a long while past. In particular it has become evident to all observers that the means of communication between the north and south sides of the river are insufficient. Within comparatively recent times a road tunnel has been opened in the East of London, the Tower Bridge has been built, and London and Blackfriars Bridges have been widened; yet the cry is for still more bridge accommodation, and this in spite of the fact that the substitution of motor for horse traffic, with its increased speed and reduction of space occupied by individual vehicles, has considerably enhanced the carrying capacity of each bridge. Various proposals have been put forward from time to time to accomplish the desired end, that most favoured at the present moment being the erection of an additional bridge, to be known as St. Paul's Bridge, by the Corporation of London, involving alterations upon both sides of the river which would be exceedingly costly.

Whatever is done, it is necessary that the south of London should to a certain extent be replanned. There is a great area lying along the south bank of the river which is greatly in need of development, consisting at the present time almost entirely of slum property, yet capable, if properly connected with the wealthy north, of being made an integral part of the productive, working Metropolis.

It requires something more than the erection of an additional bridge and its approaches to do what is required.

In addition to St. Paul's Bridge, there has been a good deal heard of late of the need of an extra bridge either at Charing Cross or the Temple. The first practical suggestion with regard to this was made in a leading article which appeared in the *Building News* for December 22, 1905, immediately after the disaster to the roof of Charing Cross railway station, in which it was suggested that a great opportunity had arisen for transferring the terminus of the South Eastern and Chatham Railway to the south side of the river, close to Waterloo Station, and for opening out Hungerford Bridge (which is generally known as Charing Cross railway bridge) to road traffic. A rough sketch plan accompanied the article, showing how this might possibly be accomplished. Sir John Taylor and Mr. T. E. Collcutt, speaking in turn from the chair of the Royal Institute of British Architects during the following year, both advocated that the same thing should be done; and so also, somewhat later, did Professor Beresford Pite, while Mr. Collcutt, in partnership with Mr. S. H. Hamp, produced a design for a bridge, which would serve much the same purpose, in continuation of Northumberland Avenue. This design was hung in the Royal Academy, and was notable for the suggestion that there should be shops upon either side of the roadway.

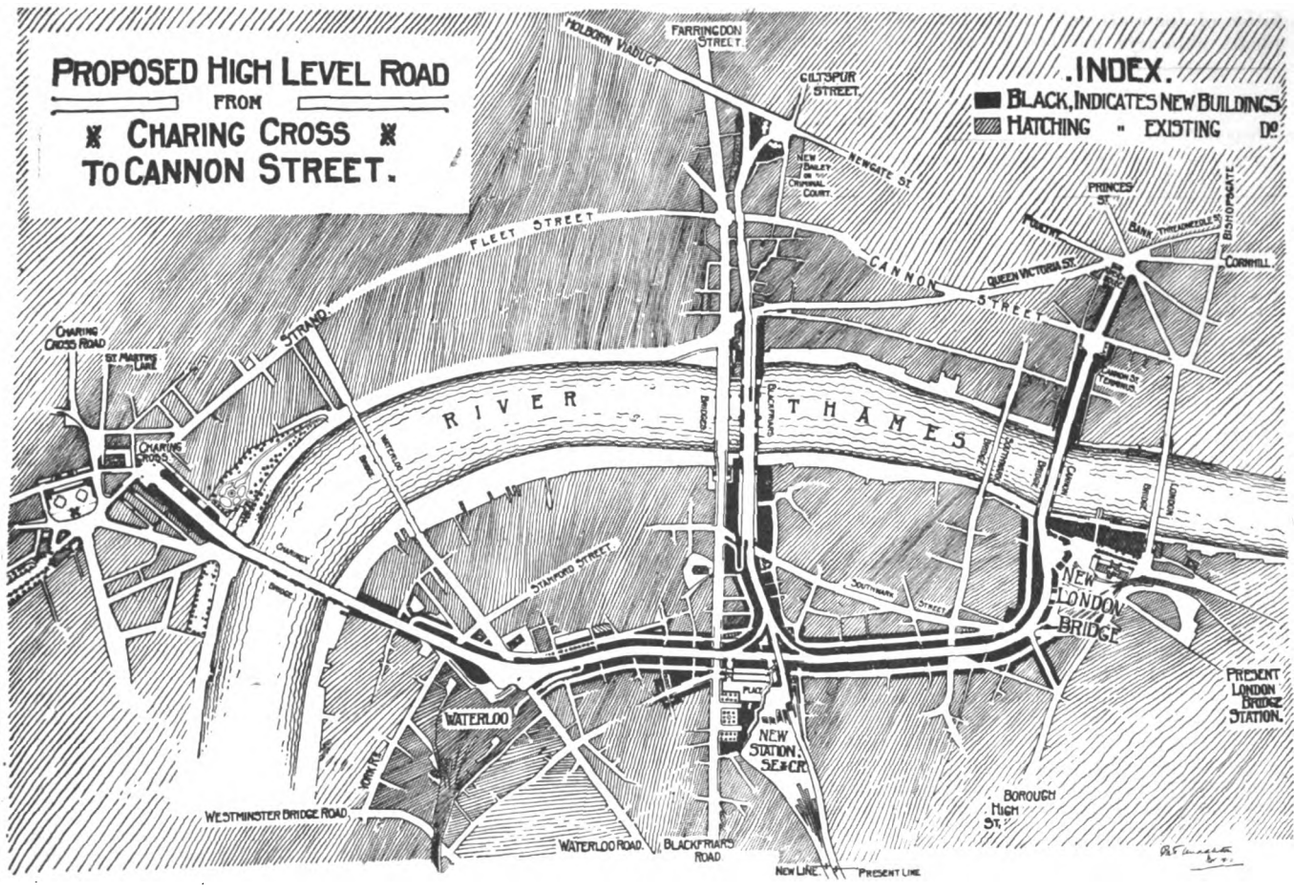
For some time nothing more was heard of the suggestion, until Mr. John Burns in his speech at the Guildhall, at the opening of the recent Town Planning Conference, stated that he would like to see not only Charing Cross Railway Bridge done away with and a station put on the south side, but that he would dearly love for the Cannon Street and Blackfriars railway bridges to be similarly treated. It was fairly obvious, however, that he did not think the idea to be practicable.

Its practicability is a matter which demands a considerable amount of attention.

The three bridges in question all serve termini of the same railway company, the South Eastern and Chatham. At the time when they were built the South Eastern and the Chatham

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and Dover Railways were distinct, and in competition for the Continental traffic by the short crossings via Dover and Folkestone. Each of them was anxious to have both a West End and a City station. At that time it was important that each should serve the north side of the river with ease. The two companies have now combined, and it must be a serious encumbrance to them to possess, besides their West End station at Victoria, three other termini, each involving an independent staff, the upkeep of a bridge, and a large amount of unnecessary train mileage. Even five years ago, before motor traffic had developed to the extent to which it has now, there was a considerable amount to be said in favour of the north river stations which does not apply at present. Provided that a good central terminus could be built on the south side, readily accessible by main roads both from the City and the West End, the railway company would gain rather than lose by the change. Fortunately, there is a way of doing this which has been provided by the railway itself, in not merely an economical manner, but in a way which should be actually profitable to the company most concerned. A high-level road, carried upon arches, already exists across South London from Charing Cross to Cannon Street. Railway metals are laid down on it at present, but it would not be at all a difficult thing to replace these by a highway, forming a great circular road, 80 feet wide, particularly valuable for rapid motor traffic, and with debouches so arranged as to connect it at all important points with the main highways of South London.



While obtaining Parliamentary power for such a road, there would probably be no difficulty in at the same time securing property on both sides of it, and to form two parallel lower roads connecting Borough High Street, Blackfriars Road and Waterloo Road. These would be lined with shops and business premises, and those backing on to the arches of the high-level road would carry more shops facing that road also. The property to be thus dealt with is almost all of it of small value at the present time, but would become of great value on conversion.

Instantly the whole district lying between the new circular road and the river would be opened up. The improvement would be vast in itself, but it would lead to a great deal more being done in the future. It is a district which, as will soon be seen, would be served by three great railway termini, and it could not fail to develop.

The construction of this high-level roadway would involve the destruction of both Charing Cross and Cannon Street railway stations and their accompanying hotels. A new terminus would have to be provided to replace them. The best position for this would undoubtedly be close to the Blackfriars Road, where the higher-level line from Holborn station crosses the present loop line from Charing Cross to Cannon Street. The high-level line could, of course, be left, but the preferable thing would be to deal with it in the same way as with the loop line, converting it into a roadway with shops on both sides where the available width permitted. It would then serve the new South Eastern and Chatham Railway terminus from Holborn and the north of London.

Thus one great terminus would replace the present three at Charing Cross, Cannon Street and Holborn, the greater proportion of the traffic to which would almost surely be retained, owing to the ready means of reaching all parts by motor bus which the new road would provide. New traffic, too, would be created to serve the needs of the new roads and of the considerable area opened up for business purposes.

It would, however, be necessary, at some expense, to divert the main South Eastern line at New Cross and raise it so as to pass over the Brighton line, and then connect it across to the new station. This would render the present London Bridge station of the South Eastern and Chatham Railway unnecessary, and the metals between it and New Cross of no value. But the London, Brighton and South Coast Railway is badly in need of both more station accommodation and more metals, which could be provided by allowing that company to use the present South Eastern metals, and to build a new station on the circular road, which would serve it a great deal better than the present London Bridge station is served. There is an excellent site for it to the south of Southwark Cathedral, in the fork formed by the existing metals of the South Eastern and Chatham Railway, and above the Borough vegetable market, which could be well accommodated underneath.

A third railway whose interest would be involved is the London and South Western. The new circular road would pick up Waterloo Station on its route, and provide a much-needed high-level approach to it, easily reached by motor-bus or taxicab from the City at Cannon Street, the north at Holborn, and the west at Charing Cross.

In the scheme thus roughly outlined the interests of three great railway companies—the South Eastern and Chatham, the London, Brighton and South Coast, and the London and

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South Western—are thus intimately involved. To carry it out to completion would require a certain amount of negotiation between them. This is no more than could be accomplished if all entered into the matter with the determination that fair justice should be meted out to all. Probably the work could best be done by the South Eastern and Chatham Railway alone, the others contributing such shares or taking such profits as might be just; and the profits would be very large indeed, even after allowing a fair share for the present value of the roadway and the cost of acquiring the necessary additional land, and undertaking the large amount of new building involved. It is only necessary to suggest that, on a conservative estimate, some ten miles of frontage would be created which would be available for shops, offices, hotels and warehouses, to indicate that an enormous profit rental would accrue.

Three great termini, near Waterloo, Blackfriars, and London Bridges would now be located on the new circular road, and each be at its level, as the Waterloo terminus is already. The greatly improved means of intercommunication thus provided between them should be equally advantageous to all. They would also have booking offices on the level of the lower roads, connected with the rail level by lifts and stairways, as is done at the Central Station at Antwerp, and elsewhere on the Continent. It is, by the way, somewhat astonishing that this plan was not originally adopted at Waterloo in place of the existing steep inclines for cabs.

It might be necessary, and in fact it is so shown on the accompanying diagram, that there should be a still higher level again at Blackfriars Station, in order to utilise the present railway metals which now go to Holborn, these being possibly employed for Continental and main line traffic only, the middle level being used for suburban traffic, and the low level, entered from Blackfriars Road, being given up to a goods yard and sidings, from which trucks could be raised by lifts to the rail level above.

Considering the scheme in somewhat greater detail, it will be obvious at once that many architectural opportunities present themselves. Charing Cross Station and its hotels would give way to a square, with probably a new hotel along one side of it and fine shops along the other. As a considerable number of houses to the west of the present station belong to the railway company, it might be possible to include them in the area dealt with, although this is not indicated on the diagram. The railway bridge, as it stands at present, is certainly not a thing of beauty, yet anyone who has studied it must recognise that there would be no great difficulty in so encasing both the piers and the girders with concrete, and facing this with stone, as to convert an eyesore into something which was at least dignified and worthy of the river. The external girders need not be interfered with, though probably the other main girders would have to be replaced by new ones of a different form, again embedded in concrete, so as to form the front of shops which would face the roadway, a few gaps being left here and there to enable pedestrians to obtain a glimpse of the fine vistas along the river. The bridge is so exceedingly wide that this could be done, and yet leave an 80-feet roadway. When Waterloo Station is reached another open space could be provided, which ought to be capable of architectural treatment, and the debouches to be arranged down to the outer and inner parallel circular roads and the main roads of South London should all provide further opportunities also. As soon as the shops facing the lower roads were built, and those facing the upper roads erected above them, the present ugly railway arches would be cased in, and a fine architectural treatment secured throughout the whole length of the new roads.

At Blackfriars there would be another great architectural opportunity provided, where the road from Holborn would cross at its high altitude over the circular road, close to the new terminus of the South Eastern and Chatham Railway. Possibly a great deal more could be done here than is indicated on the diagram. At any rate, an important railway hotel would have to be provided, and a square would be formed on the lower level, opening out of Blackfriars Road, to at least make up for the loss, as an open space, of a present existing square whose existence is not generally known. The terminus of the Brighton line at London Bridge would afford yet another opportunity, especially if a debouche were made from the new roadway, to the foot of London Bridge, on the north side of Southwark Cathedral, which would thus be opened up, and if the present warehouses and wharves along the riverside were replaced by a great hotel and an embankment.

Cannon Street railway bridge would be dealt with in the same way as that at Charing Cross, and the station opened out in a somewhat similar manner, with hotels, shops, and offices erected on either side of the broad approach thus formed. There might be a little trouble here in connection with the Underground station but for the fact that it is an unnecessary station in any event, owing to the proximity of the Mansion House Station. Do away with this station and there would be no difficulty then about the levels, as the descent from the bridge to Cannon Street could be quite gradual. Here, however, if the advantage of the bridge is to be felt to the full, something serious would have to be done. An approach to it would have to be provided from the north, and not alone from Cannon Street. If it were attempted to do this by widening Walbrook to the full width of the present space to the west of the Mansion House, the destruction of the church of St. Stephen, Walbrook, would be involved, and, considering that this is one of Wren's masterpieces, nothing of the sort could be contemplated. Similarly, to widen St. Swithin's Lane would involve the destruction of St. Swithin's Church. Nor would either of these alternatives provide a direct approach to Cannon Street bridge, nor greatly ease the communication on the north to the junction of Princes Street, Threadneedle Street and Cornhill. This is only to be obtained by cutting a new road through where shown on the diagram, from Cannon Street to the east of the Mansion House, which would be thereby opened out to view as it never has been in the past. It would be an expensive thing to do, as Salters' Hall and two banks, to say nothing of less valuable property, would be destroyed. New sites for these would have to be provided and new premises built. As, however, the provision of the new road bridge at Cannon Street would do away with the necessity for the St. Paul's Bridge, it is perhaps not too much to ask that the cost of this improvement should be borne by the City of London; in fact, it may perhaps be suggested here that a considerable proportion of the outlay involved in converting railways into roadways might very justly fall upon the London County Council and the City.

Just as there would be shops on Charing Cross and Cannon Street bridges, so others would also be built on the bridge at Blackfriars, which could be utilised to relieve the traffic across the present Blackfriars Bridge by forming a debouche to Queen Victoria Street. St. Paul's Station would, of course, be done away with, and a good opportunity is again offered here for architectural treatment. Another debouche to the north of Queen Victoria Street, though not shown on the diagram, could easily be made, and would provide a much-needed rapid means of communication from Holborn to the Victoria Embankment.

Yet it is at Holborn that the greatest opportunity of all occurs. By a little boldness of treatment and the acquisition of existing property it would be possible to open out a really fine space in front of the Central Criminal Court. This would provide access to the new high-level road from Giltspur Street and the north, as well as from Newgate and Holborn.

And, finally, what would be the gain to London?

There would be three new bridges provided between the north and south sides of the river, where the demand is at present for one. These bridges would be of such width as to ensure a sufficiency of intercommunication for the next hundred years to come. There would be a fine roadway connection from north to south, and another from east to west, linking up all the main roads on both sides of the Thames, adding immeasurably to the possibilities of the architectural treatment of our great City, and providing for its growth, as a business centre, over an area in the south which is at present a maze of slums. But the beauty of the whole thing is that the necessary roadways already exist in the main, and although the subsidiary roadways and the debouches are valuable, and perhaps essential to the scheme, they could be easily provided. Another great point in its favour is that the whole thing could be carried out at a profit, provided that it were tackled courageously by the persons most interested. Greater things than this have been done by Englishmen in the days when our railways were laid down; surely they could be accomplished now by the same courageous railway companies, especially as simultaneously there would be valuable property created and a great London improvement effected.

Mr. H. L. FREYBERG, in opening the discussion, remarked that one of the complaints made from time to time at the recent Town Planning Congress was that the schemes carried out of late were not sufficiently comprehensive. This fault, however, could not be laid to the door of the scheme proposed by Mr. Middleton. In his inaugural speech at the Guildhall Mr. John Burns had been far from complimentary as to the æsthetic qualities of those who designed the bridges across the Thames, and he expressed a wish that the railway bridge which interrupted the view of St. Paul's should be

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pulled down. The view put forward as to the decorative character that ought to belong to a bridge is exemplified in Venice and Florence, and also by that well-known and charming bridge at Bath. If such a standpoint were adopted in this country for future bridges architecture would be more involved in this movement than civil engineering.

Mr. JOHN TODD thought that the boldness of conception displayed in the scheme was enough to take one's breath away. He much regretted that he was unable to regard it with very much favour. The great means of communication in London were direct north and south and east and west. It was difficult to see that this new road—magnificent in conception though it was—would prove of as much benefit as might at first be thought. To bring a vast volume of traffic immediately to the east of the Mansion House would alone be deplorable, for the streets around that point are already nearly impassable about eleven o'clock. Furthermore, if the proposed Cannon Street bridge were constructed additional vast street-widening would be essential. The same difficulty applied at the Charing Cross end. The cost of the scheme would be absolutely prohibitive, though it may be that in years to come a profit might be made. But no railway company or combination of railway companies, or the London County Council would be willing to pledge their credit for it. It should be remembered that the Kingsway improvement scheme practically paralysed the L.C.C. for years so far as street widening was concerned. It would be interesting to have an estimate of the cost of the proposals. There was at present a vital need for widening the eastern end of Leadenhall Street at the point where there is a bottle-neck some 17 feet wide. The authorities, however, find it practically impossible to effect this on account of the expense. How much more would this difficulty apply to the scheme proposed. His opinion was that although London needs better street accommodation and greater facilities for its vast traffic, there is at present an even greater need which Londoners feel—and that is the necessity of rest from taxation. London would be better served by the authorities holding their hands for a few years in order to let trade recover and confidence spread all round than by providing great traffic facilities. A great and inexpensive improvement would be provided, however, if the legal limit for the height of buildings in the City were raised from 80 feet to 250 feet, and by levying a contribution from the landowners who would thereby benefit, such money to be devoted to street widening. If this were done no vast interests would be imperilled.

Mr. ARTHUR HARRISON remarked that the scheme looked to him as if it provided a large number of accesses to the City, but it did not provide real communication between North and South London.

Mr. F. W. SPEAIGHT confessed he had one strong regret in listening to the paper, and that was that he had not proposed it himself, for there was much in the scheme that was really brilliant. If he were in the position of chairman of the railway companies he would tell his board that as there seemed to be money in the proposal they ought to look into it. No one would pretend that this was an architectural scheme, for it was purely a traffic problem. The first point to be considered was how it would facilitate traffic. It had apparently escaped Mr. Middleton's mind that the many millions of people who at present travel to the north side of the river would still have to get to that side, even if they were turned out of their trains on the Surrey side. The number of vehicles required to convey the passengers would be enough to fill the roads and cause such congestion that little or no real improvement would result. Speaking architecturally, Mr. Speaight suggested the pulling down of the Mansion House, which now requires rebuilding. This would offer a beautiful vista, terminating with the Bank of England. Mr. Middleton's scheme (said Mr. Speaight in conclusion) ought not to have been put forward without an idea of its cost, as there arose a danger when this was done that the architectural profession might be regarded by the public as a lot of dreamers. It seemed a pity that the scheme had not been worked out a little more carefully before the public were invited to pass an opinion upon it.

A vote of thanks having been passed by acclamation, Mr. G. A. T. MIDDLETON replied to some of the points raised. He was, he said, somewhat disappointed with the smallness of the amount of criticism. The scheme was not fully prepared, but merely a sketch scheme which had occurred to him while listening to Mr. Burns's opening address of the Town Planning Conference at the Guildhall. The necessary preparations for the paper had had to be carried out in a very short space of time, so as to be ready for the date allotted for it. Furthermore, it seemed to be necessary to speak out before the St. Paul's Bridge project had gone too far for it to be stopped if the authorities thought it wise. The same cause was the reason for the cost not having been worked out. The proposal was brought forward merely as a sketch idea in the hope that something might come of it. It had been drilled into them that if Wren's scheme had been carried out they would be in possession of a fine London. There seemed now a grand opportunity for doing something for South London.

ENGLISH DOMESTIC WORK.—VIII.

THE eighth and last of the highly successful course of illustrated lectures which Mr. J. A. Gotch, F.S.A., F.R.I.B.A., has been giving at the University College, Gower Street, W.C., was delivered on December 15. It dealt with

Eighteenth-Century Houses.

The eighteenth century saw the final development of that great movement in architecture which in England began in the early years of the sixteenth. The influence of Italy commenced (said Mr. Gotch) in the reign of Henry VIII., and increased until, under the two Charleses and in the hands of Inigo Jones and Sir Christopher Wren, it triumphed over the last remains of our native methods of design. It was largely a victory of the text-book over the workshop. Gradually the architect with his text-book took the place in design which was formerly occupied by the workman with his traditions. This had its advantages and disadvantages, one of the latter being the divorce of architectural design not only from architectural construction, but to a large extent from practical considerations of convenience. In the eighteenth century architecture was little more than the Five Orders. The "Gothic Order" was described by a lively French writer of the time as "The Folly and very Ape of Architecture." A sagacious, unimpassioned Englishman, Evelyn, in speaking of architecture, wrote:—

"It is the antient Greek and Roman architecture only which is here intended, as most entirely answering all those perfections required in a faultless and accomplish'd building; such as for so many ages were so renowned and reputed, by the universal suffrages of the civiliz'd world, and would doubtless have still subsisted had not the Goths, Vandals and other barbarous nations subverted and demolish'd them, introducing in their stead a certain fantastical and licentious manner of building, which we have since call'd 'Modern' (or 'Gothic' rather), congestions of heavy, dark, melancholy and monkish piles, without any just proportion, use or beauty, compar'd with the truly antient: so that when we meet with the greatest industry and expensive carving, full of fret and lamentable imagery; sparing neither of pains nor cost; a judicious spectator is rather distracted and quite confounded than touch'd with that admiration which results from the true and just symmetric, regular proportion, union and disposition; the great and noble manner, which those august and glorious fabrics of the antients still produce. It was after the irruption and swarms of those truculent people from the North, when instead of those Beautiful Orders they set up those slender and misquine pillars, or rather bundles of staves, and other incongrous props, to support incumbent weights, and pondrous arched roofs, without entablature; and tho' not without great industry nor altogether naked of gaudy sculpture, trite and busy carvings; 'tis such as rather gluts the eye than gratifies and pleases it with any reasonable satisfaction. For proof of this (without travelling far abroad) I dare report myself to any man of judgment, and that has the least taste of Order and magnificence; if after he has look'd awhile upon King Henry the VIIth's Chappel at Westminster; gaz'd on its sharp angles, jetties, narrow lights, lame statues, lace and other cut-work and crinkle crankle; and shall then turn his eyes on the Banqueting House built at White Hall by Inego Jones after the antient manner; or on what his Majesties present surveyor, Sir Christopher Wren, has lately advanc'd at St. Paul's, and compare them judiciously without partiality and prejudice and then pronounce which of the two manners strikes the understanding as well as the eye, with the more majesty and solemn greatness. In this sort have they and their followers ever since fill'd, not all Europe alone, but Asia and Africa besides, with mountains of stone, vast and gygantick buildings indeed, but not worthy the name of Architecture: witness what are yet standing at Westminster, Canterbury, Salisbury, Peterborow, Ely, Wells, Beverley, Lincoln, Gloucester, York, Durham and most Cathedrals and Minsters."

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The fact is that architecture was grievously misunderstood by writers like Evelyn and Addison, and by the designers of the period. In their view it dealt almost exclusively with pictorial effect. Planning to them meant, first and foremost, the arrangement of a building in regard to its appearance, not in regard to the functions it had to fulfil. They forgot that architecture is not merely the art of building finely, but that it is the art of building finely in order to comply with certain specific conditions. The continued cultivation of the Italian manner for nearly two centuries, the increasing importance attached to the rules of proportion which governed so many of the buildings of Italy, resulted in making architectural design largely a matter of rule and compass. The rules were so well known that it required no particular aptitude to apply them. In architecture, however, it is not the correct marshalling of columns and the "nice conduct" of entablatures that must be the criterion, but the manner in which the whole building satisfies and expresses the wants which it is expected to supply. Judged by this standard, how many of the designs in Campbell's "Vitruvius Britannicus" would come within the category of true architecture? And yet those volumes contain nearly all the larger houses built in the first half of the eighteenth century.

In matters of art the eighteenth century was very artificial. Campbell introduces one of the designs thus:—"This design of my invention in the Theatrical Stile is most humbly dedicated to Tobiah Jenkyn, Esq." The large houses of the period were all more or less theatrical—that is, they were designed with a view to impress the beholder rather than to provide a comfortable home. Campbell dwells not on the convenience of arrangement, the cheerful aspect of the rooms, or whatever goes to make a house or home, but on the proportions of his principal apartments. Architectural grouping in order to impress the beholder often led to dividing the mansion into separate blocks—one, in the centre, for the family rooms and state apartments, and, on each side, one for the kitchens and servants and one for the stables. The kitchen would be, therefore, hundreds of feet off the dining-room. Sometimes the servants' quarters were located in two detached blocks, hundreds of feet apart, balancing the composition of which the family rooms formed the centre, and joined to the latter by open colonnades. The servants had to put up with what accommodation they could get. But they could hardly expect to be exempt from suffering from architectural effect when their employers were content to be located in a low basement with all the weight of the state apartments over their heads; and if the occupants were comfortable it was more by good luck than good management.

The architects of those days were, in fact, many of them, amateurs, and the kind of architecture in demand was such as amateurs could supply. Pre-eminent among them was the Earl of Burlington, who, according to Walpole, "had every quality of a genius and artist except envy." Such a man could scarcely be expected to concern himself with the niceties of house planning. Walpole, however, described the villa of Chiswick (1729) as "a model of taste, though not without faults, some of which are occasioned by too strict adherence to rules and symmetry. Such are too many correspondent doors in spaces so contracted; chimnies between windows, and, which is worse, windows between chimnies; and vestibules, however beautiful, yet too little secured from the damps of this climate. The ground apartment is rather a diminutive catacomb than a library in a northern latitude." Walpole, writing elsewhere of the time, says: "It was in this reign (of George II.) that architecture resumed all her rights. Noble publications of Palladio, Jones, and the antique recalled her to her true principles and correct taste. She found men of genius to execute her rules and patrons to countenance her labours. She found more, and, what Rome could not boast, men of the first rank, who contributed to embellish their country by buildings of their own design in the purest style of antique composition."

But while they were sadly lacking in the true essentials of architecture, they undoubtedly produced striking results. One of the fine palaces, when it was surrounded by its original gardens, must have been remarkably imposing. Take Blenheim, for instance. Regarded as a home it is disappointing; but as the dwelling of a great noble, living in state and surrounded with all its attendant ceremony, receiving other great nobles with their retinues, and housing them in great magnificence—in these respects it has much claim to commendation. The effect of these palaces is, perhaps, rather depressing on the ordinary person; the grandeur is a little too obvious; there is no such feeling of homeliness as in the many-panelled rooms of the early seventeenth century. But, when all is said, the fact remains that the architects of the later time had a very definite aim in what they did, and they achieved it.

The houses of the squire and the well-to-do-merchant had a much pleasanter atmosphere. They possess a quiet dignity which is decidedly restful and attractive, especially those of the first quarter of the century, which will long remain to form the model for houses of similar kind. In later times the portico idea became too prevalent. The formal and precise treatment often led to a dignified interior, with its fine staircase or chimneypiece or ornate long corridor. Their surroundings were treated in the same fashion as the big houses, *i.e.*, with terraces, flights of steps, and important gateways.

If, said Mr. Gotch, in conclusion, we are to seek inspiration from the eighteenth century, we shall find it (1) in the grand schemes of house and garden combined, (2) in the general grandeur of treatment of the great houses, and (3) in the sober and simple houses, where the plainness of the general appearance is sometimes unexpectedly broken by the quaint treatment of a door or chimney, and where the joiner's work is full of homely lessons.

A PEACEFUL RETREAT.

By JOHN A. RANDOLPH.

IT is a long way from the village under notice to the railway station that is supposed to serve it, and mostly uphill from there to the heart of this interesting place. Though it is bisected by motoring hustlers from north to south and east to west, it still keeps it old-fashionedness to a most remarkable degree, as well as its large green with a picturesque tree-sheltered pond in one corner.

Our first discovery of this scattered village was from the northern side, on coming down to it by a long hill and wide road, well sheltered with fine trees one side and hilly, undulating land to our left, after we had once got beyond the long, exposed rise from the nearest town, from which we started on our explorations.

A few small houses and an aggressively modern chapel at the outskirts of the village, at a little distance from the green, flanked our right as we drew nigh to a partly hidden modern red-brick hotel-cum-public-house-cum-garage, with a big notice-board on top of the bank of bushes. They have done wisely to set this structure back and hide it under foliage, for which one may be grateful. A sharp turn to the left, eastwards, along a fine road for cycling, and with a fair and short ascent that had to be negotiated within a few minutes of our left-turn, brought us to a delightful little lane—delightful to look at, but a "Giant's Causeway" in miniature to walk over. We stumbled as cautiously as possible over this path, and passed a pleasantly located large house, with old-fashioned steps up through the bank to the front garden (which stood at right angles to the lane), and became aware of the propinquity of a splendidly proportioned and shaped spire rising up from a tower hidden from our view by a large church which was itself almost invisible through the trees; and, with our appetite whetted, we hastened so as to secure the advantage of a favouring patch of sunshine between clouds for making some photographic records of it from points of view unobtainable on postcards, and also showing details that do not appear in the only cards obtainable, of the church, which we have. That is our usual practice in such cases.

We found the church stood more or less in one corner, and quite at the side of the God's Acre, and a rather sharp fall of the ground at the north-east corner, reminding us very much of the beautiful plot of ground at Worplesdon, with its grand tree-clad downhill sweep to the east. But the church here is of great interest, architecturally and archæologically, and its three west gables, with a rich Norman door to the nave one, are very striking. The tower, simple, lofty, and bold, stands on the south side, near the east end, and before its spire was altered must have been very imposing; but the architect responsible for making the change has succeeded, in our opinion, in giving the whole steeple unwonted dignity and grandeur. He has brought this about by dividing the spire about half-way up and inserting a straight footing to the top portion of some ten feet, and of some sixteen to the lower section. The spectacular gain is enormous, and the sacred edifice has now the appearance of a tower-church.

Needless to say the architect was that lover of the great and the daring, Sir Gilbert Scott!

Nestling alongside the churchyard is a singularly successful block of timber-framed almshouses, with picturesque little mortuary chapel, by the same master-hand.

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Facing the west front is a narrow lane, entered between two cottages, and as soon as these dwellings have been passed one is between two fields for a while, and then among the bushes and trees and shrubs on the right one is suddenly aware of a large expanse of water, between this lane and the cycling road referred to earlier in this narrative, and we noted a man with a rod, fishing, quite unconcernedly, from a punt in the middle.

About a quarter of a mile from the church, at an irregular grouping of inn and farmhouse and the winding exit of the path into the main north and south road, there stood revealed to us the flanking wing, beautifully timber framed, of a fourteenth-century hostelry that bears two appellations, one of which is, of course, the inevitable "White Hart." This name seems to occur in nearly if not quite all the villages of the county, and there must be some mysterious reason for this evidently popular nomenclature.

Perhaps some county antiquary can elucidate the matter.

The inn, apart from its venerable old age, has a history it, or rather its owner, may well be proud of, as there is record of the visits of several sovereigns of England to the house, including that of our great and good Queen Victoria.

A big gable, projecting, with an interesting bay window, over the low oak-beamed dining-room which overlooks the green and the road north and south; a sideways entrance to the adjoining small lobby that does duty for a hall, with a narrow, winding old staircase therefrom; and, among the charming old-style rooms along the passage on the first floor, a magnificent wainscoted apartment overlooking the lane through the timber work we saw—all goes to gladden the heart and the eyes of the lover of the picturesque. The fittings and ornaments—old-time crystal-laden chandeliers, huge and quaint vases, old prints and splendid mirrors—all are in keeping with this truly royal room—"a sight for the gods" in very truth.

Curiously enough, there is no timber work in the gables or on the front. A splendid bit of wrought-iron work, from which hangs a richly painted signboard with the ubiquitous hart, projects from the face of the building. Bracket and board are worthy of the house and worthy of their respective executants. A board on the south wall bears the year of erection (1388) and the record of the royal visits.

There are a few smaller and less ancient inns—one close to and the others dotted about the other side of the green; and some small shops and a rather aggressive modern dairy—one at the corner, on the way up to the cross-roads; and the remainder of the uphill "street" is very much of the country village type, barring a few houses, near an extensive gravel pit, in a newish thoroughfare parallel with and eventually turning into our cycling road.

Going southward, however, from the historical "Hart" the road is suddenly narrowed very much for a few yards, followed at the bend by pleasant fields on the left and a winding road for about a mile or more up and down hill, with plenty of free-growing hedge and trees before one comes into the long "straight" downhill to the railway station at the foot, and thence, under the line, to flatter but still interesting country beyond.

Some of our readers may have already recognised the delectable spot we have been guiding them round about. But those who have not succeeded in doing so we strongly urge to make the acquaintance of, in spite of motorists, peaceful Godstone.

MANCHESTER SOCIETY OF ARCHITECTS.

In a paper read before the Manchester Society of Architects on Wednesday, December 14, Professor Capper said that the idea of building a great Roman Catholic Cathedral in London might be said to date from the restoration of the hierarchy, with the appointment of an Archbishop of Westminster in 1850. But it was not until the time of Cardinal Vaughan's prelacy that Mr. J. F. Bentley was, without competition, entrusted with the great work of designing the building.

Cardinal Vaughan laid down certain conditions as to size, space, chapels, and the style of the building, but otherwise Bentley had a free hand in the design. Owing to its proximity to Westminster Abbey, and to the existence of a great classic cathedral such as St. Paul's not far distant, it was considered desirable to avoid competition with either as far as style was concerned, although Bentley had a decided leaning towards Gothic. Cardinal Vaughan, however, selected Byzantine, and Bentley felt that his duty was to accept the style (which he called primitive Christian), and adapt it to congregational needs. Almost immediately after his appointment Bentley left for a tour of the domed churches of Italy, but, curiously enough, did not proceed to Constantinople.

Professor Capper then traced the evolution of the domed church, from the simple nave with two or three domes, as found in the South of France, to the Greek cross type, with five domes, as at St. Mark's, Venice, and proceeded to explain how Bentley's final design was arrived at, by plans showing three different stages in its development. The first scheme showed aisles axial with the eastern chapels, and two campanile at the west end. In the second the nave arcade was continued across the transepts, which greatly helped the continuity of the interior, and one of the campanile was omitted at Cardinal Vaughan's request. The third and final plan showed the addition of sanctuary aisles and a narthex, and the removal of the campanile to the north-west. Some very interesting diagrams, showing the construction of the building, were explained by the lecturer, who pointed out that externally the main flying buttresses were placed opposite the centre of the domes, and not opposite the piers, as one would expect. Externally, Professor Capper said, it was essentially a brick church, but he thought that the effect of the stone bands was, perhaps, rather too stripey, until they had toned down with age. The site was much too confined to get a proper view of the building.

Mr. J. F. Bentley died suddenly on March 2, 1902, and it was not until January 1903 that the bronze cross was fixed on the campanile. In conclusion, Professor Capper compared the Cathedral with that of Alby, a brick building of the thirteenth-fourteenth centuries, with a vaulted roof of 60 feet span, and a dignified and impressive exterior, which he thought was a more restful treatment than that adopted at Westminster.

OUR CONTEMPORARIES FROM OVER-SEAS.

The *American Architect* (New York) illustrates a further series of examples of recent domestic work by Messrs. Albro and Lindeberg, who seem to have a penchant for the use of the Doric order, Greek, Roman, or Renaissance.

Construction (Toronto) devotes a considerable portion of its space to the Town Planning Conference and Exhibition recently held in London under the auspices of the R.I.B.A. The Canadian buildings illustrated this month are: "An attractive Toronto bungalow of Spanish type" by Messrs. Langley and Holland, and "An all-stone house of Old English design" by Mr. J. A. McKenzie. This latter has many features that are modern, not "old," and several that are not English, so the description is scarcely literally accurate.

Arkitektur og Dekorativ Kunst (Christiania) gives a good series of designs for the buildings to be erected for the exhibition at Christiania to be held in 1914. A number of competitive designs are illustrated for "Det Bergenske Dampskibsselskap."

Berliner Architekturwelt (Berlin) is this month a monograph on the public buildings of the Berlin suburb Weissensee, which include residences for officials, a gymnasium and restaurant, a high school, and a pumping station. The architect of these buildings is Herr Carl James Bühring, whose designs, picturesque in grouping, are a remarkable study in the use of brickwork, to which a quite uncommon expression is given.

The *Architectural Record* (New York) deals with the development of American commercial architecture, an appreciation of the sky-scraper, which is described as the first American type of real value. A well-illustrated account of the Brussels Exposition is given by Mr. Francis S. Swales. The series of articles on the architecture of American Colleges now deals with Dartmouth, Williams and Amherst. Mr. G. A. T. Middleton, in his study of the evolution of architectural ornament, now treats of "Ornament with a Linear Basis."

Engineering Record (New York) has an interesting article on the use of "Metal Wall Forms for Concrete Houses," by which it is stated that monolithic construction can be economically employed.

The Ecclesiastical Commissioners have approved the plans prepared by Mr. J. S. Alder for the new church of St. Benet Fink, which is to be erected on a site given by the owners of the Downhills Estate in the Lordship Lane district of Tottenham. This is one of the churches provided under the scheme for the union of the parishes of St. Peter-le-Poer with St. Benet Fink, and St. Michael, Cornhill, in the City of London.

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LOMBARDIC ARCHITECTURE.—II.

HAVING proved to his own satisfaction, if not to that of his readers, that the first elements of Lombardic architecture are to be found in the school of Ravenna, Signor RIVOIRA deals with the intervening period from the decline of Ravenna's position till the era of the perfected Lombardic architecture, by which he means the Romanesque architecture of Lombardy in the eleventh, twelfth, and thirteenth centuries, which is usually spoken of as Romanesque. This intervening period our author* divides into two parts, the first occupying the years from the reign of AUTHARIS (583-590) to the fall of the Kingdom of Lombardy, which he calls the Pre-Lombardic style, a not too happy name, as it is the style of Lombardy during the rule of the LOMBARDS. The second part of the period is the time of CHARLEMAGNE.

The buildings of the "Pre-Lombardic" period are few in number, and, of those that are left, many have been vitally modified by subsequent rebuilding or alterations, but it was clearly an epoch of progress in which slowly but surely, through the influence of Roman, Romano-Ravennate, and Byzantine-Ravennate architecture on the Comacine or Lombard masters, with the addition of certain new elements which formed part of their natural inheritance, it advanced toward the "Lombardic" style, as understood by Signor RIVOIRA, of which it was the precursor and for which it prepared the way.

Although the church of Sant' Eusebio at Pavia is not so old as the Lombard period, Signor RIVOIRA considers that it contains valuable evidence of the carving of that age. This is chiefly seen in the capitals of columns in the crypt, which, barbarous in their character, have in their design no counterparts among the many and varied capitals of the "Pre-Lombardic" style, but reveal the fact that a new art was coming into being, showing itself at first in a somewhat timid and barbarous guise, but always original. The date of these capitals Signor RIVOIRA assigns between 583, the year in which AUTHARIS ascended the throne, and the reign of ROTHARIS (636-652).

A building to which Signor RIVOIRA draws special attention and one which, he says, has not been hitherto noticed in the history of art, is the parish church of Arliano, near Lucca. In this he finds evidences of treatment that afterwards became characteristic of Lombardic architecture, and are by some assumed to have originated at the later epoch. The date of this church is suggested as later than Sant' Eusebio at Pavia and earlier than San Pietro at Toscanella, which latter is the next building to be considered by our author. Of the date of this church varied opinions have been held by different writers, and Signor RIVOIRA comes to the conclusion that it is the result of four distinct periods. To the earliest, the time of LUITPRAND (712-744), belongs the original church, comprising the east end and the three adjoining bays of the nave of the present building, with a crypt or "confessio" beneath, which has been rebuilt and enlarged at some later date. To the second period, the last years of the eleventh century, are to be assigned the existing crypt below the presbytery, the raising of the floor of the original chancel, and the erection of the present ciborium over the high altar. To the third, or middle of the twelfth century, are to be ascribed the extension in length of the primitive church, and the construction of the oldest portion of the façade. Lastly, to the fourth period, or end of the twelfth century, must be attributed the central portion of the front, and also the tesselated pavement in the central part of the chancel and the nave. The reason for the assignment of these various dates is largely based upon the difference in treatment of carved decoration, into which Signor RIVOIRA goes fully, with many excellent illustrations.

Full justice is also done to the embellishment of the external walls with blank arcades and arched corbel courses divided by small lesenas or pilaster strips, a feature invented at Ravenna, developed by the Comacine or Lombard guilds, and afterwards characteristic of "Lombardic" or Romanesque architecture.

The basilica of San Salvatore at Brescia, begun in 753, is the last of the buildings described by Signor RIVOIRA as illustrating the character of the Pre-Lombardic period, of which, despite the fewness and poor character of the remains, the author holds a higher opinion than the existing building justifies to most observers. A lengthy dissertation is given on the peculiarities of the carving both of capitals and other decoration of the "Pre-Lombardic" period.

Architecture during the time of CHARLEMAGNE is largely illustrated by examples in Dalmatia, where the presence of Comacine and Ravennate carvers is made to account for the Romanesque or Lombardic character of the buildings.

From the date of CHARLEMAGNE's conquest of Lombardy (774) to the full development of "Lombardic" architecture belongs the study by the Lombard guilds of vaulting and the art of counterbalancing its thrust. Prior to Carolingian times they had confined the application of vaulting to the apses and rather limited crypts of their basilicas, and possibly also it was used in baptisteries. Proceeding, they next vaulted the whole of the chapels and the bays of a church in front of the apse, where it became necessary to increase the chancel space, with the result that it was only the body of the church which continued to be covered by an open timber roof or ceiling. Then began the use of external buttresses corresponding to the arcades of the interior, and later they proceeded to throw across the aisles transverse arches springing from compound piers and wall piers. Next they threw arches across the nave, supporting them on substantial cruciform piers, alternating with columns or small piers, and on wall piers.

The next task was to cover the naves of their churches, and this they did first with barrel vaults, strengthened by transverse arches; then with cross combined with barrel vaulting of the previous kind; lastly, with raised cross vaults, with the groins strongly emphasised throughout their whole course, or else ribbed to serve the combined purpose of facilitating the construction of the vaults and of increasing both its strength and decorative effect. From these ribs were developed the vertical shafts which resulted in giving a more complex and at the same time more varied form to the compound piers. Groined

* *Lombardic Architecture: Its Origin, Development, and Derivatives.* By G. T. Rivoira. Translated by G. McN. Rushforth, M.A. In two volumes. (London: William Heinemann. 63*s.* net.)

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vaulting of this kind was at first only used for the aisles. Later it was extended to the nave. Such is Signor RIVOIRA's account of the gradual development of vaulting, which alongside of improved carving and growth of elaboration in the treatment of features and detail brought to perfection the "Lombardic" style.

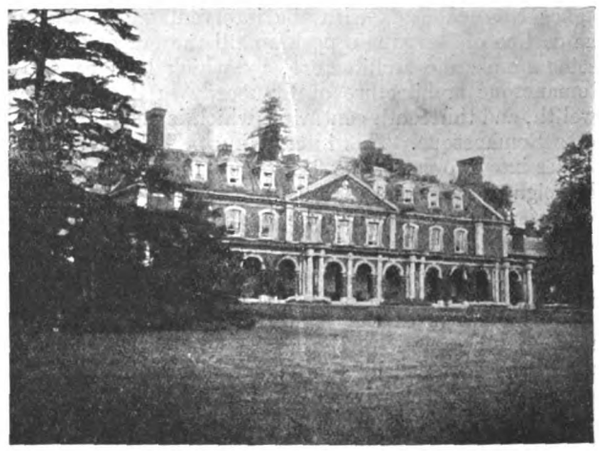
Following his usual scheme, Signor RIVOIRA examines a large number of churches in chronological order, taking the opportunity of the occurrence of special features to enlarge upon other examples of these, as, for example, the use of "opus spicatum" or herring-bone masonry, which he traces back to brick-floor construction of the time of AUGUSTUS and in the decadence of the Roman Empire to its employment in walls between the third and fifth centuries.

The earliest example of what in Anglo-Norman architecture is often described as the "cushion capital" is claimed by Signor RIVOIRA to be that found in the basilica of Sant' Abondio, outside Como, the date of which he fixes as 1013. An interesting discussion is given of the use of stylophorous animals so frequently found in connection with porch treatment in Lombardic churches. Thus in pleasant and instructive fashion our author leads us to the perfected Romanesque, or, as he has it, Lombardic architecture of Pisa.

BROMLEY.*

THE history of the Manor of Bromley commences with Ethelbert and Offa, two Saxon kings who gave land in this place to the Church of Rochester. Ethelbert is remembered by the fact of his conversion to Christianity, and Offa by a less creditable event—that he murdered his son-in-law, and to atone for his sin adopted the convenient method of causing his people to pay an annual fine to Rome. The place, as the old charters have it, was called Bromley in 862, indicating a tract of land which the fourth Ethelbert, King of Wessex, gave to one of his ministers; this gift is recorded as measuring ten carucates or ploughlands, and the boundary marks extend into what are now surrounding parishes.

It is not recorded at what date a church was first erected at Bromley; the absence of any mention of it in Domesday Book has caused one writer to suggest that possibly public service was held in a chapel within the episcopal residence. About forty years after the compilation of Domesday Book the sum of ninepence, the amount due from a parish church, was paid by Bromley as chrism rent, the tribute anciently paid to the bishop by the parish clergy for their chrism or consecrated oil for baptism, &c.; this fact points to the existence of a church at Bromley in early times. Another circumstance which points to the same conclusion is the fact that the body of the font now in the church is of Norman workmanship. Bromley Church is situated in the centre of the town; its chief feature of interest perhaps is the fine square western tower, which is visible from a large district to the south of the town. This part of the church has been pronounced of Norman date originally, but it has undergone considerable alteration during the fourteenth century; the north aisle was not built until 1792, when it was erected at the expense of Dr. John Thomas, Bishop of Rochester. The church has been much altered and added to from time to time. During the fourteenth century the whole structure, probably including the tower, was rebuilt; in 1830 there was a general renovation and the turret was added to the tower; in 1873 the church was restored; and in 1884 a new chancel, south chancel aisle and new vestry, with organ chamber, were built. The font already referred to is of Bethersden or Purbeck marble and of a common Norman type; the bowl is original work, is 2 feet 4 inches square, and each of its four sides is ornamented with four semi-circular-headed sunk panels; the base is modern. In the chancel is a beautiful ornamental recess of early thirteenth-century date, which has been considered by some to be a small tomb or a cavity for a heart shrine; a marble monument with armorial and other enrichments commemorating Bishop Zachary Pearce, which records his offices and rapid preferments; he died 1774. Several of the monuments in the church are noteworthy. These include brasses to the following:—Isabella Lacer, 1361, on the north side of chancel; Richard Thornhill and two wives, 1600, a fine brass, the figure of Richard Thornhill nearly 3 feet in length, in the nave before the chancel steps, protected by a mat; John King, 1603; John Young, 1605; Jane Bodenham, 1625; and John Maunsell, 1625. Of the monuments other than brasses, probably the most interesting is that to Elizabeth, wife of the famous Dr. Samuel Johnson, so frequently mentioned as "Tetty" in Boswell's Life; this is in the nave aisle, close to the fonts. The two following inscriptions record the death of a great friend of Dr. Johnson, viz. Dr. Hawkesworth, and Elizabeth Monk:—"To the memory of John Hawkesworth, LL.D., who died, 17th November, 1773, aged fifty-seven years. That he lived ornamental and useful to society in an eminent degree, that he laboured for the benefit of posterity, let his own pathetic admonition at once record and realise. The hour approaches in which whatever praise I have acquired by these compositions will be remembered with indifference, and the tenour of them alone will afford me comfort. Time, who is impatient to date my last paper, will shortly moulder the hand that is now writing it in the dust, and still the heart that now throbs at the reflection, but let not this be read as something that relates only to another; a few years only can divide the eye that is reading from the hand that has written this truth. However obvious and however reiterated, it is frequently forgotten, for surely if we did not lose our remembrance, or at least our sensibility, that alone would always predominate in our lives which alone can afford us comfort when we die.—Bromley, Kent, March 8, 1754." There is also an epitaph in memory of Elizabeth Monk, who died in 1753, aged 101; the inscription is by Dr. Hawkesworth,



VIEW OVERLOOKING THE GROUNDS, BROMLEY PALACE

affixed to the outside of the south wall. In the south gallery is a tablet to the memory of Thomas Chase, Esq., formerly of this parish, born in the City of Lisbon, November 1, 1729, and buried under the ruins of the same house where he first saw the light in the ever-memorable and terrible earthquake which befell that city on November 1, 1755, when, after a most wonderful escape, he by degrees recovered from a deplorable condition, and lived till November 20, 1788, aged fifty-nine years. The custom of ringing the pancake bell on Shrove Tuesday was once observed at Bromley Church. A tradition affirms that the ringer of the bell was entitled to receive one pancake from each house in the town; the original purpose of ringing the bell was to call the parishioners to the church, where the priest sat in an open chair or stall to hear the confessions of the people, and to award them such penance as he thought good for them, and to give them absolution. The week preceding Lent was an appropriate time for all to perform that duty. It was for that reason called Shrove-tide, and the Tuesday in it was formerly, and still is, known as Shrove, Shrive, or Confession Tuesday. On Shrove Tuesday the housewives, in order to use up all the grease, lard, dripping, &c., made pancakes, and the apprentices and others about the house were summoned to the meal by the ringing of a bell, which was for that reason denominated the pancake bell. There is a large lych-gate at the pathway leading to the entrance to the church. The register of baptisms in Bromley Church commences in 1558, marriages in 1575, and burials in 1578.

The most important of the various public institutions of Bromley, that known by the name of Bromley College, which faces the London Road, close to the busy streets of

* Read at a meeting of the Upper Norwood Athenæum by Mr. R. M. Bromley.

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Bromley, is really a home for widows and daughters of clergymen of the Church of England. It was founded by Dr. John Warner, Bishop of Rochester, who by his will, dated only five weeks before his death in 1666, bequeathed the sum of 8,500*l.* for the building of a hospital or home for the reception of twenty poor widows of orthodox and loyal clergymen and a chaplain; the Bishop also charged his manor of Swayton, in Lincolnshire, with the annual payment of 450*l.*, which was distributed among the inmates in shares of 20*l.* each year, while the remaining 50*l.* was given to the resident chaplain. The building of the College was commenced in or soon after the year 1670, and some of the bricks and stone columns used in the work are said to have been obtained from the ruins of that part of London which was destroyed in the Great Fire of 1666. An important addition to the institution was made in 1794, when ten new tenements, built with Mrs. Helen Bettinson's generous bequest of 10,000*l.*, were completed. The bequest was actually made in 1788. In 1782 Mr. William Pearce, brother of Bishop Pearce, left 12,000*l.* for the building and endowing of ten new houses. The bequest was payable after the death of his great-niece, and the new tenements were therefore not completed until 1805. In 1840 Mrs. Sheppard founded five additional houses with a stipend of 44*l.* each for maiden ladies, daughters of clergymen, who had previously resided with their mothers in the College. The widow of Bishop Atterbury's only son died a pensioner in 1789, aged eighty. Bromley College is the largest and oldest institution of the kind in England, and its benefits are by no means confined to the diocese in which it is situated. The building consists of two open quadrangles, surrounded by colonnades of stone carrying the projecting parts



FRONT VIEW, BROMLEY PALACE.

of the upper storey, and affording a sheltered way to the various residences. A noble doorway in the middle of the main front gives access to the first quadrangle, which, with the residence of the treasurer and chaplain, belongs to the original seventeenth-century structure; the chapel on the opposite side of the quadrangle has been rebuilt. The original chapel occupied the same site and was flat-roofed. Bromley College contains forty sets of apartments, each consisting of a comfortable sitting-room and bedroom above, a smaller bedroom over the entrance passage, and a kitchen. The situation of this old building is remarkably beautiful, and, one can imagine, a charming spot in which to spend one's retiring years. The College was thoroughly repaired in 1765, the mother of General Wolfe having left 500*l.* for the purpose. It is considered probable that Bromley Palace was an episcopal residence for the Bishops of Rochester, at Bromley, as early as the eleventh century. Hasted, the Kentish topographer, suggests that it was built by Bishop Gundulph soon after the year 1080. It is said the Palace soon fell into a ruinous condition, and in the time of Bishop de Glanville it was found necessary to rebuild it. Towards the end of the seventeenth century the chapel attached to the house was rebuilt by Bishop Sprat. His successor, Bishop Atterbury, made several important additions to the place; but the greatest benefactor was Bishop Wilcocks, who repaired the buildings and improved the gardens at considerable cost. After these restorations the Palace remained with but little alteration till Dr. Thomas, on his promotion to the See of Rochester in 1774, finding the house much dilapidated, pulled the whole of it down and erected a new building in 1776. Bromley Palace remained in the possession of the Bishops of Rochester until the year 1845, when it was sold by virtue of an Act of Parliament. Mr. Coles Child, the father of the present Lord of the Manor, purchased the estate, and made considerable additions to the building. Although the Palace residence belonged to the bishops for such a long time it was not until after the Reformation that it was in such constant use. Several of the Bishops of Rochester died in Bromley Palace, and some were buried in the parish church. Of the various bishops who have resided at Bromley, three of the most noteworthy were Bishop John Warner, to whose munificence Bromley owes that excellent institution, the College; Bishop Thomas Sprat, who was falsely accused of high treason; and Bishop Francis Atterbury, who was found guilty of treason and banished. The last Bishop of Rochester who lived in the episcopal residence was Dr. George Murray. In the grounds of Bromley Palace was once a spring called St. Blaize's Well; the virtues of the water were probably discovered in mediæval times, as an oratory dedicated to that saint was built over it. At the Reformation, apparently, the well and its oratory fell into disuse, and the sites of both in course of time were forgotten. I find the spot has been again located and put in repair. At one time, when Bishop Wilcocks lived at the Palace, his son interested himself in the work of separating the medicinal spring from other sources and making it accessible to the public; and a good measure of success attended the use of the waters, which appear to have been richer in mineral contents than the famous springs at Tunbridge Wells.

THE PAINT AND VARNISH SOCIETY.

A MEETING was held at St. Bride's Institute on December 15, when Mr. Gaston Depierres presided, and among the visitors present were several eminent members of the R.I.B.A. A discussion on the "Notes on the Properties and Ingredients of Commercial Paints" (published by the R.I.B.A.) was opened by the Chairman.

Mr. DEPIERRES said: It is but a short time ago that this little book, entitled "Notes on the Properties and Ingredients of Commercial Paints," compiled by the Science Standing Committee of the Royal Institute of British Architects, was handed over to me, and that I was asked by the members of the standing committee of the Paint and Varnish Society to criticise it in a friendly way, and in doing so as much as possible to voice the opinion of our members. I do not hesitate to say that I felt most honoured by this proposal, but the task that I was asked to accomplish appeared to me to be one surrounded by insurmountable difficulties. Was I not asked to speak on behalf of a society composed of paint manufacturers and paint users? Two bodies of men more antagonistic in the past could hardly be imagined. But, realising that the Paint and Varnish Society has enrolled them under its banner, I began to think that I might venture to speak to-night on behalf of both of them.

It may be thought presumptuous to criticise a work which has been carefully compiled by some of the most eminent members of the Science Standing Committee (R.I.B.A.), but men such as they do not fear criticism. It will suffice for me to read a short paragraph in this little work to give you an idea of the spirit that animated the members of the R.I.B.A. Committee, and also the reason for the remarks I venture to make this evening:—

"Though, as already stated, standard definitions and the tests upon which materials should be accepted or rejected appear to be, in the present state of knowledge, exceedingly difficult of preparation, the following descriptions may be found useful as a basis for a schedule which may obtain eventual recognition, and the data given will, it is hoped, serve to draw forth some valuable comments and criticisms from those interested in paint manufactures, without whose co-operation the practical outcome of any standard specification must be small."

Who could offer more unbiassed criticism, who could co-operate better and with more practical outcome, than the members of the Paint and Varnish Society? We are to-day a perfectly unique body, composed of experts from all parts of the world in various branches of this important industry, all wishing to learn or to impart knowledge, doing missionary work for the good of both sides. Nowhere in the world, not even in America, where the technology of paint is very advanced, does there exist a society like ours, which, perfectly free from jobbery and prejudice, strives with all its might to bring together paint manufacturers and paint users for their mutual benefit.

It is not my purpose to criticise *ad seriatim* what has been said of the various paint materials in this monograph—

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it would serve no useful purposes; long treatises have been written on each of the articles to which this little book devotes but a few lines. I prefer to attack the principle with which it is impregnated throughout—The Theory of Purism.

Pure white lead, pure white zinc, pure linseed oil, pure turpentine, pure this, that, and the other, may be employed, and I may say are used every day to produce paints of little value and utility; pure pigment, pure binder, is a relic of past ignorance. It is useless for architects to rely upon chemical analysis. When one considers that most pigments are allotropic, that paint liquids are rarely alike, and that paint changes in many ways with age, the chemist's test by itself is of little value. Chemistry can, no doubt, tell us the things that have been used in making a paint, but it cannot very accurately define its physical state, nor can it foretell what the paint will do, and it is only what it will do that is the true measure of its value and worth.

The value of a pigment is not defined by its chemical composition; white lead or oxide of zinc may be chemically pure and yet be of no use whatever as a pigment. consequently it is undeniable that the physical state has a preponderating influence. Undoubtedly there are allotropic states different from the matter—that is to say, modification in the nature of crystallisation; also, from the chemical, or I should say better, chemico-physical point of view, the presence of a certain matter in small quantities has a great influence on the physical state.

I emphasised this point when I had the pleasure a few months ago of reading before you my paper on "Zinc Oxide"; when I emphatically stated that the presence of from 2 to 4 per cent. of lead salts brought about a modification in the pigmentary value of zinc oxide and rendered it softer, more opaque, and altogether a better pigment than chemically pure zinc; and I may say that the support given to my theory by many prominent paint chemists in England and abroad since my pronouncement has again strengthened my faith in the fact, that the value of a pigment cannot be defined by its chemical composition: this, as I have said before, is the cause of the great mistake made by some public bodies and a quantity of buyers.

New materials have come into use which have taken the place to a large extent, and for many purposes, of the time-honoured white lead, and the scientific paint manufacturer has begun to educate the public to the superiority of one material over the other. One can find many cases where materials which were once despised or condemned are regarded to-day with much favour. We have an excellent example in a valuable white pigment—lithopone, which is not even mentioned in this book, though more than 15,000 tons are yearly used in this country.

Mr. Toch, in his book on "The Chemistry and Technology of Mixed Paints," rightly says:—"Lithopone has gone through many vicissitudes; no pigment has been blackguarded quite as much as this, and yet no pigment has survived its condemnation as well as this." Considered purely from the chemical standpoint, lithopone, on being analysed will be found to be composed of 70 per cent. barytes and 30 per cent. ZnO, yet no man to-day would be so bold or so ignorant as to say that a paint made of lithopone and containing 70 per cent. barytes is adulterated.

To-day, paint-making has been rescued from the domain of empiricism, having been put as far as possible under the control of exact science; one skilled in it can practise it with a certainty of results in exact proportion to his knowledge of its principles, and his ability in applying them. In making paint of value, the secret—if there be any—lies in the proper adjustment of the amount and kind of each material needed to secure a perfect product. The progressive paint manufacturer of to-day can design paint to meet any reasonable condition of location, atmosphere, surface, application, drying and wear; but, of course, in order to do so, he must know these conditions: these being known to him, architects need have no fear in entrusting him to manufacture coatings which will accomplish the desired result. He can then make paint fulfilling all the necessary conditions—viz., quick-drying, acid proof, waterproof, and to a certain extent weatherproof; but there is one thing he cannot do, and that is make it fool-proof! To-day, a painter or paint-user who attempts to grind or mix his own paints is as unlikely to succeed as if he were to attempt to make his own varnish, brushes, &c. This book, gentlemen, represents a worthy effort; and although it will fail to bring about any improvement, it has at least the advantage of showing us that to-day architects have become aware of the fact that it is necessary for them to learn more about the composition of the various paint products, and to know what characteristic properties are given to paint by this or that raw material, so that he may use his judgment and discretion in selecting paints capable of producing beautiful and durable results.

It conclusively shows that the members of this honourable profession, having at heart their reputation and the interest of their client, have become aware of the fact that in the future it will be necessary for them to rely upon someone more qualified to meet their wants than the ignorant painter. To-day it is possible to get paints uniformly well prepared, thanks to the technical schools equipped with modern paint machinery and laboratories, who supply the paint manufacturer with men well trained in this important industry. For many decades English varnishes and paints have enjoyed all over the world an unrivalled and well-deserved reputation, and are still to-day superior to any foreign production.

As I have already said in a paper which I had the pleasure of reading before you in January 1909, on "Paint, and its Application to Structural Steel," the importance of the proper application of paint receives less attention than it deserves. Painters having a technical knowledge—the result of their attendance at technical schools—are very difficult to find. Architects and engineers should demand the employment of competent artisans to do their painting, for good results are quite as much dependent upon the goodwill, intelligence, and ability of the painter as upon the quality of the paint used.

Much has been said and written of late regarding the apparent failure of paints enjoying a good reputation. From personal experience, and from information gained from others, I am led to conclude that some contractors use less of the paint specified than has been presumed. What they do use is also frequently applied under such unfavourable weather conditions as to preclude the possibility of obtaining satisfactory results. Most of us well know that nearly every complaint as to the non-drying of paint, when carefully investigated, is found to be due to insufficient cleaning, or application under unsuitable weather conditions, and not to its chemical composition. To attempt to apply paint in damp, frosty, or foggy weather on a greasy or dirty surface is waste of time, material, and thought.

I venture to suggest that one of the best methods to secure better painting is to have the painter's work carefully superintended by competent and vigilant inspectors or clerks of works; my experience of these men as a class is that they are competent, intelligent, and reliable, and I am of opinion that no work of any importance should be carried out without one of them being employed. If architects and engineers included in their specifications a clause stipulating that all painters on the job shall be qualified and hold a certificate of efficiency from a recognised institution, we should soon see a great improvement in painting works. Unfortunately, to-day, the painting trade is encumbered with all the refuse of other trades, and the lowest of the low, slackers, even house-breakers, find it their best refuge.

Gentlemen, it is in your power to bring about the necessary reform, to lift this trade to the level of others, and, by insisting that the men who do your work shall hold a certificate of efficiency, you will make the painter an artisan proud of his trade, and ready to do your work honestly and well.

In conclusion, I will only state:—(1) That chemical analysis is of value only to determine the exact composition of the material substances; (2) that physical tests under normal conditions give very conclusive data; (3) that accelerated tests under "abnormally severe conditions" are of little value; (4) that the long service test is of much value; (5) that the method of application is equally as important as the quality of the paint; (6) that to know the probable results to be obtained from the use of a paint, one must know the following things about it—(*a*) its history and mode of preparation, (*b*) its physical properties, and (*c*) its chemical properties.

Mr. R. C. BUSSELL congratulated the President on the admirable manner in which he had brought the matter forward. He was especially pleased by the remarks as to Great Britain leading the world in the matter of paint making. He believed the question of application was the crucial point, but the difficulty was to know how paint makers could deal with the subject. In his experience people who ought to know better treated the makers as ignoramuses when they suggested that greater care should be paid to the application of the paint. As a case in point he might mention a very important piece of work for which he supplied the paint. One or two good painters were employed, and they had a few more men to fill up time. As there were some places a little difficult to reach, a pole was obtained, 8 to 10 feet long, with a tin socket into which to put the brush, and they tinkered about with that. How was such a matter as that to be dealt with? Of course, when things went wrong, it was the fault

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of the paint. He hoped the discussion would lead to some practical suggestion for getting people responsible for the use of paint to employ proper painters.

Mr. MATT GARBUTT, F.R.I.B.A., said that, as secretary of the Science Committee of the Royal Institute of British Architects at the time the little pamphlet was produced, he was particularly pleased to accept the kind invitation extended to him to be present that evening. He thought the pamphlet itself explained why its scope was so restricted. All architects from time to time found very great difficulty in specifying paint. It was difficult to specify with precision because of the absence of agreement among paint-makers and users as to what paint should be. Whatever was put in the specification, somebody who knew something about paint would come along and offer adverse criticism. A chemist might perhaps be able to say something in defence of the particular clause attacked, but the majority of architects were not chemists, and they could not, from personal knowledge, say very much about it. Therefore, when serious discussions arose, they had to appeal to the expert for assistance. It was only in large works that enough money was available to deal with the thing on anything like a scientific basis, and to get sufficient inspection and analysis of the paint, and to do all those things that were necessary to ensure anything like a good result. Everyone knew the kind of paint that was very often put on all classes of work. He remembered noticing in certain railway stations about a year ago a good deal of red paint being put on which looked extremely bright for a day or two, but the greater portion of which six months later was almost white, bleached right out. That was a sort of thing architects would like to guard themselves and their clients against, and the Science Committee's efforts had been directed towards the production of a specification that would help them to do so.

It might be interesting to refer to what had led up to the issue of the book. The subject had been talked about for a long time amongst the members of the Institute, and one or two specifications that had been actually used, including one which specified certain points of chemical composition, were brought forward for discussion, and the suggestion was made that the Institute should produce a Standard Specification. Fortunately there were one or two members of the Committee who knew something of chemistry (his co-secretary, Mr. Munby, for instance), and either from their point of view or from some other, exception was taken to a large proportion of the clauses put forward. It was soon seen that, unless the paint-makers would heartily co-operate, the production of a document even worthy of serious consideration, though with no claim to finality, would require many years and a large expenditure upon experimental work. It was ultimately resolved that, under the circumstances, all that could be immediately done was to make an effort to put forward something to start a good discussion, in the hope that it would be taken up seriously by the reputable manufacturers, who, in their own interest as well as in the interest of their customers, should see if they could not devise something that would enable the architect to specify clearly what he wanted, and so give him some chance of getting it. An architect looked at matters largely from the artistic point of view, and the line of demarcation between the materials of the painter of pictures and the materials of the house painter was not very sharply drawn, but the pigments used by painters of pictures were on the whole immensely more expensive than the material of the house painter, and was therefore out of the question. It was rather with the idea of limiting the scope of the observations of the Committee that the words "commercial paints" were inserted. He was a little sorry that the President did not deal more with the details of the pamphlet. The question of purity was one of the things the Committee discussed at considerable length. In a sense he quite sympathised with the observation of the President that to require pure paint was a relic of past ignorance, and quite understood that there were a number of materials that might be effectively used to-day that were quite unknown fifty years ago. On the other hand, names were used to-day in the most misleading manner, and it would be extremely useful to have some authoritative work dealing exactly with the subject. There were some things that came immediately to one's mind as varying very much in composition. He had asked Mr. Munby whether there were any paints the composition of which could be with confidence assumed from the name used, and had suggested vermilion as being of this class. Mr. Munby, while believing that the word vermilion was originally applied to sulphide of mercury, was not at all sure that specifying vermilion to-day would enable us absolutely to demand sulphide of mercury in our paint. He (the speaker) desired to know the composition of the colours used on ancient Chinese paintings, colours that looked as fresh as when they were put on, because such colours, he thought, might safely be taken as standards of colour more or less satisfactory, and as standards of colour which would stand for long periods whether in decoration or pictures. He thought it would be possible to issue some sort of volume giving the composition of such pigments as were known and used in ancient days, particularly those which, after the lapse of centuries, had not appreciably changed, together with particulars of the modern paints now representing the old ones. In that way a sort of standard of comparison would be formed. To-day people wanted such and such a red or blue paint used upon their house, but they wanted the work done at impossible prices, and the man who made the paint had to say:—"As I have to produce an appearance that should cost 2*l.* for 6*d.*, I will see if I can give the effect you desire by using some substitute for the costlier material," and sometimes he succeeded. Nobody could accuse the man of being dishonest in giving something that really was not vermilion or ultramarine; the fault lay in applying those names to other things. To-day there were many names applied to materials that were really substitutes for the things that those names connoted, and this, as a matter of fact, was, unfortunately, the same in every trade. "Rolled gold," looking like real gold, was sold in the jeweller's shop, and when a purchaser was told that it was a little skin of gold over an inferior metal he was not swindled, but if the purchaser was not told he might get taken in. To-day the expression "rolled gold" in many shops was carefully ignored, another name less well known to the public being used to mean the same thing. If the paint trade would endeavour to avoid any openings for such a charge in connection with paint, it would be to the benefit of everybody concerned. The paint maker might say:—"Here are colours containing a number of materials that were not used in paints twenty years ago, but they have the following qualities: they cover well, the colour will be permanent or approximately so for house painting purposes, and so on," and in that way the case would be fairly well met. To use names and apply them indiscriminately to varying substances tended to leave an opening for the introduction of bad material under the name of good, and damage public confidence very materially indeed. Of course, the question of cost was an important one. Artists used pigments that were openly classified by recognised authorities as permanent, semi-permanent, or fugitive, as the case might be, and if the manufacturer of commercial paints would be as frank as that the architects would have something definite to go upon. The manufacturer might, for instance, say that certain pigments could be guaranteed to last on external work under ordinary conditions for ten years without materially fading, or say equally frankly that certain pigments would not stand for six months in the sun. There were many colours that would not stand, and the architect had to avoid them to-day in an empirical way. He used them once, and finding them a failure never used them again, although probably the second time the colour was brought to his notice it might be a different thing altogether in its composition, and stand far better than the first that gave him his unpleasant experience. In conclusion, he hoped the members of the society would deal with the details of the pamphlet as well as with the generalities it contained. It was put up as a target for the freest criticism.

Mr. Garbutt also said that what architects were really anxious to produce was a specification which would meet with the approbation of the good paint manufacturers and enable architects to say what they really required. Then, if unsound paint was sent on to a job, architects would be able to protect themselves and their clients, and in a sense protect the manufacturers also. In fact, they wanted to be able to say, "This does not comply with our specification in such and such a definite detail, and therefore we absolutely condemn it." Such a specification was very difficult to arrive at, and the book was an effort to initiate a discussion which should eventually result in such a specification. To meet the case it was necessary to have something quite clear and precise, a specification that would actually enable offenders to be taken into court. In order to do that some sort of agreement must be arrived at with manufacturers as to what really constituted a good paint. Mr. Garbutt also said that the committee were quite prepared to accept a specification subdivided according to the class of work for which it was to be used, just as the steel specification of the Engineering Standards Committee is subdivided. Clearly a paint might be extremely good for the Forth Bridge and unsatisfactory for a house front in a London street.

Mr. CHARLES HARRISON congratulated the President on the able paper he had read, which put forward one or two very crucial points concerning paint. He was often con-

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sulted as to troubles builders were in with paint, and he ventured to state that 98 per cent. of them when inquired into had been due to want of knowledge on the part of the workmen, good paint having been spoilt for want of proper application. He hoped architects and those responsible would use their influence in getting the actual painter to join some technical institution and learn something of the technical side of the subject.

With regard to the pamphlet dealing with the stability of paint from a chemical standpoint, it was said:—"The question of chemical permanence is evidently one which has not yet greatly influenced the manufacturers of paint materials." He wished to refute that assertion, because he knew that the bulk of the paint and varnish manufacturers were to-day employing the very best ability and doing all that was possible to attain the acme of results in that direction. Some manufacturers had chemists attached to their works to examine the stability of the pigments and to see that the material was free from contamination. Frequently paint was contaminated by the workman using it. He did not like the word "pure" in the pamphlet. It was hardly a chemical word. The word "purity" to a chemist was a very serious matter, and was very rarely used, even in such an important work as the "British Pharmacopœia." In connection with turpentine, it was said in the pamphlet that nothing should pass over below 155° C. He had had considerable experience in the distillation of turpentine, and was quite certain that something did pass over below 155. If the view set forth in the pamphlet was held, analysts on finding that something did pass over below 155 would report to that effect, and the report would probably condemn a perfectly genuine turpentine. Only lately he had an instance of some turpentine being questioned because the thinner in the varnish was found to have a specific gravity of .862.

The pamphlet dealt very thoroughly with pigments, but not a word was mentioned about the binder, except linseed oil. The committee evidently had overlooked the fact that it was not so much the pigments as the composition of the binder that was of importance. Many architects insisted that the paint should dry in a certain time, but forgot that the quicker the binder dried the quicker was the paint destroyed. There was no possibility of compromise with linseed oil; any alteration altered its properties, and an alteration of its properties meant destruction of the paint. Then it had to be remembered that, when the paint commenced to dry, dust began to settle upon it, alkaline dust, composed of all sorts of refuse, the coarse particles of which, sticking on the paint, acted as ledges. Then came the rain, which washed the dust and dirt well into the ledges. In winter came the fog, containing elements of a very destructive nature to a linseed-oil film. All these points had to be very carefully considered.

Mr. W. WONNACOTT, A.R.I.B.A., Hon. Sec., Science Standing Committee, R.I.B.A., said he now had the privilege of occupying the position on the committee which Mr. Garbutt occupied when the "Notes" were issued. The matter arose out of a question of the desirability of a standard specification for paint. The first consideration was a point of professional practice, and had to be given, not to paint manufacturers, but to the young architect just starting in practice, who, by employing a model form, might put into his specification something which he knew nothing at all about, and thus place himself in a very serious position by posing as an expert, but being unable to say if his specification was carried out properly. Therefore the Science Committee thought something should first be done to afford architects information of a detailed nature on the subject. Naturally the committee consulted some who were experts in the matter, but, being unable to obtain any assistance of a satisfactory nature, consequently had to proceed in the best way they could without them. The literature on the subject was enormous, and was ruled out on account of occupying too much time in digesting it, so that the little pamphlet had merely been thrown out tentatively to start a discussion in which it was hoped some grains of wheat might be gathered from the chaff. As Mr. Garbutt had said, it was a target to be shot at, and he hoped the Society would not hesitate to shoot at it.

The paper of the President was very good so far as it went, but it attacked the principle only on the ground that purity was highly inconvenient to the manufacturer. He had been much struck with the concluding point of that paper, that it was essential to know three things—the history and mode of preparation, the physical properties, and the chemical properties. Pure chemists and pure physicists could say something upon the two latter subjects, but when inquiry was made into the mode and nature of preparation of any particular paint, the committee found the whole trade as a body refused to disclose anything. Naturally the architect, making his test by the old-fashioned rule of thumb, condemned material that had failed, and never used it again. Architects certainly thought they were entitled to know, as responsible parties, something of the preparation of the material, and that was why he appealed to manufacturers to assist the architectural profession to bring about a closer accord between the manufacturer and the user, without, of course, disclosing so-called "trade secrets." Manufacturers' representatives who possessed no technical knowledge were found to be a great nuisance; evidently the time of the skilled representative must be too valuable to permit him to visit architects and explain the material. In fact, it was difficult to discover a trade representative who could answer questions in an intelligent way, and therefore the only thing to be done was to go to the friendly manufacturer and get him to disclose a little more. He agreed that paints lasting too long and standing too well were bad from a trade point of view, but there was the test of service. The builder wanted his certificate from the architect far too soon, because the architect was not in a position to quickly express a technical opinion on the quality of the paint, owing to its not having stood long enough to permit him to form a proper judgment. In that way he was completely at the mercy of the manufacturer. With regard to the proper method of application of paint, he thought everyone was agreed upon its importance, but it was a matter that concerned the trade far more largely than architects. As to raising the standard of the artisans, that did not really concern the architect, because he had no voice whatever in the employment of labour, and could only bring indirect pressure on the builder or decorator.

The President having set aside the theory of "purism," and given no suggestion of what should take its place, he hoped the members of the Society would deal thoroughly with the details, so that out of friendly discussion and criticism they might devise something which even the Paint and Varnish Society would consider worthy of its approval.

Mr. MCINTOSH said he had not had the advantage of reading a copy of the pamphlet, but he had seen some specifications over the signature of a certain architect, every one of which he thought was inapplicable, asking for something that could not be done. Architects required a certain shade and composition, and those two must tally. With regard to the question of training, Mr. Jennings had done yeoman service in that matter, and was the first to draw attention to the fact that the painter in this country had no means of receiving a technical training. The London County Council prescribed certain labour conditions and a fair rate of wages, and might well go further and insist on every painter only employing men who had served apprenticeships to the trade. There was room for a painting school outside the polytechnics altogether. What was very necessary was affiliation of all connected with the trades and professions bearing on the subject in one and the same building, where everything could be tested by trained experts. In Scotland it was the old-fashioned painter who had been apprenticed to master painters in the small town who ran away with the prizes in the West of Scotland Technical College, and in his opinion nothing could act as a substitute for apprenticeship.

Mr. CRUICKSHANK SMITH hoped the attention of the meeting would be confined to the subject-matter, as he thought there was some little danger of losing an invaluable opportunity for free discussion with architects. The President had drawn attention to a definite little booklet containing some notes which formed the subject of their meeting that night, but hitherto, it seemed to him, the discussion had wandered rather wide of the mark. He thought everyone who read the book would appreciate that it was a very earnest and carefully-thought-out attempt on the part of professional men, architects and engineers alike, to arrive at some definite understanding and knowledge of what was admitted by everyone to be a very complex and highly debatable subject. It might assist in getting to the root of the question just to consider for a moment the relative positions of architect and paint manufacturer. In every contract for painting work there were three interests involved. First, that of the owner of the property to be treated with paint, whose interest the architect or the engineer was employed to protect. Then there was the manufacturer of the paint; and, finally, in many cases an intermediary, the contractor. The difficulty to his mind was that, although architects made certain stipulations which manufacturers as a rule were able to cope with, unfortunately in many cases, on account of trade usage and practice, the intervention of a third party. the painter or contractor, made it very difficult for the manufacturer to thoroughly understand what the architect required. As a

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matter of fact, specifications did not, as a rule, come before the manufacturer of paint at all, except by accident. The architect drew out a specification and invited tenders, and a certain tender was accepted. Then, without knowing anything of the previous history of a particular job, the manufacturer was asked to supply a certain material. A manufacturer might even be asked to supply goods in the ordinary way of trade for purposes for which, had he known the facts, he would certainly not have sold those goods. Therefore what was needed was closer co-operation between the scientific manufacturer and the professional architect. To show the vagueness of the subject in the minds of some people, he might point out that the pamphlet dealt mainly with pigments, whereas what the architect wanted knowledge about was paint. The same thing was still more clearly brought out by Mr. Garbutt's remarks describing paints as "house painters' materials," whereas it was a well-known fact that only a very small proportion of the paints made on a scientific basis were house painters' paints. He agreed with Mr. Garbutt that the pigments and materials used by picture painters were frequently highly finished qualities of house painters' goods, but the materials used by house decorators were not the same materials architects had in mind in getting out the book, because they spoke of permanence and protective value. Money was forthcoming, as a rule, for decorative purposes, which enabled high-class materials to be used, and in such a case there would be no excuse for a house painter to use a fugitive aniline red in place of genuine vermilion, or a very badly finished Prussian blue in place of a cobalt blue. But when it came to the protection of iron work or outside cement work, architects felt their scientific and technical knowledge somewhat scanty. Recent paint technology had practically settled the point that paints were finished materials. Paint put on under the best conditions was not made up by the painter at all, but was put into his hands in the form in which it should be used, and therefore to specify formulæ for the composition of protective paints was really a matter for the expert paint manufacturer. If an architect or an engineer was in a position to go to a thoroughly qualified expert paint manufacturer and tell him that he had a certain piece of steel or iron work that had to be treated under certain conditions, or that he had a building of reinforced concrete which he desired to protect against the weather, there was no doubt that very valuable help would be given to him by the paint manufacturer. He did not quite follow whether Mr. Wonnacott had said that the committee had invited expert assistance in dealing with this matter, and had not been able to obtain it. He should be surprised to learn that they had been refused assistance by any recognised paint expert. He believed that paint experts would be only too glad of the opportunity of co-operating with such an important and influential body as the Royal Institute of British Architects, in order to get at the bottom of what was to the technical paint manufacturer a most serious difficulty. In conclusion he suggested that at a later time some co-operation might take place between the Paint and Varnish Society, which was an educational and scientific society, with no trade element in it, and the Royal Institute of British Architects.

Mr. Cruickshank Smith also asked whether the committee of the R.I.B.A. really thought that one specification could be worded to cover all the classes of paint which might be used? The main point of his remarks had been rather to emphasise the fact that various classes of work required entirely different paints, and consequently different specifications.

Mr. JOHN LEWIS said that he agreed with the chairman's remarks that trouble and inconvenience would be certain to arise if the architects, in specifying for paint work, tied the manufacturers to any specific chemical analysis. At the same time, he was sure the representatives of the R.I.B.A. present had the sympathies of the members of the Society. There was a good deal of truth in what they had said in reference to the lack of technical knowledge in the ordinary representative. More advantage might be taken of the technical classes referred to by Mr. Harrison by representatives generally. A trained representative should not only be in a position to advise an architect for what any particular paint could successfully be used, but also the conditions under which it would, in all probability, be a failure. On the other hand, the manufacturer very often was not in possession of the fullest information as to the surfaces and conditions to which his material was to be applied. New buildings, bad and damp weather, resulting in condensation and consequent delay in drying, were often the cause of trouble for which the paint or varnish was blamed. Also, the chairman's remarks about bad workmanship were not exaggerated.

Mr. PHILLIPS said that when specifications were made out, there was often a clause that four coats of paint had to be supplied, but it was a well-known practice of painters that the first coating should not be of the same character as the second. He suggested that the paint manufacturer should be notified as to the surface on which the paint was to be applied, because applying a first coat on wood would require paint to be made up in a different way from the paint to be applied to plaster work. Many things were being said against the painter, but probably few people knew that a painter who belonged to a good society, if he turned out bad work, and it could be proved that he was not a qualified man, would be fined by the society and made to pay for the bad work he had done.

Dr. BLACKLER considered that the Royal Institute of British Architects was to be congratulated on having brought out the book at all. They had to cope with great difficulties. When the idea was first suggested that the Society should deal with the subject, the object was to obtain some helpful criticism of the work that had been done by the Scientific Committee of the Institute. In his opinion the Committee had published a book which had not gone too much into detail, and had defined complicated colours in a manner that left the manufacturer a good deal of discretion. There were one or two questions he thought the Society could deal with—*e.g.* there was the subject of turpentine. At present the London County Council allowed the use of substitutes in their paints, and it had been proved by many authorities that such substitutes could be used without any disadvantage to the paint. When varnishes are considered, it would be more advantageous to permit a certain proportion of substitute in place of pure turpentine, and employ a superior gum, than to use pure turpentine and reduce the price by employing a cheaper gum. With regard to the Committee's remarks upon driers, boiled linseed oil mixed with the materials referred to by the committee would give a very poor result, or no result at all, and the zinc-white paragraph also was *en* open question.

Mr. WILFRED NICHOLSON thought a good deal of the trouble was due to the fact that architects were very difficult to approach. Recently a specification was passed by an architect for material for gas holders of a large gas company, and the paint was specified to be made of genuine white lead. That was practically of no value in connection with gas matters, because there was so much sulphuretted hydrogen that white lead paint was useless. An attempt was made to approach the architect to explain the difficulty, but his reply was "There is no need for you to see us; we have used white lead paint so long that we know its properties." As a matter of fact the manufacturers sent the correct material.

The PRESIDENT in replying to the discussion, expressed on behalf of the members the thanks of the Society to the architects who had visited them that night. The remarks made by Mr. Garbutt had been practically answered by Mr. C. Smith. He preferred to attack the theory of purism. No doubt, one might use pure white lead, pure white zinc, pure linseed oil, and pure turpentine, and yet make a paint that would be absolutely unfit for use. The secret of making paint was the proper adjustment of each article. With regard to the necessity of some work on the subject of pigments used in olden days, there were already many books of that kind, and he did not think the chemical composition of pigments used in the olden days was a secret. It was well known that the famous reds that had lasted for many hundred years in Herculaneum and Pompeii were merely composed of red oxide of iron and lime, and the magnificent blue used in the fresco work of some of the mural paintings had been composed of ground glass coloured with cobalt salt, and it had been possible approximately to count the number of coats given to the walls to thirty-five or forty, such a number of coats being necessary to produce the required result. But where was the house-owner to-day who would be prepared to pay for forty coats of paint to produce the necessary colour? The chemist of to-day was much more advanced than the chemist of the past, and could produce to-day paints and colours far and away superior to the old colours used in ancient times. With regard to the misrepresentation made by some paint manufacturers, it was very unfortunate that there should be some who sailed under false colours, but they were outside the reputable manufacturers.

He was glad to see that Mr. Wonnacott agreed with him as to the proper application of paint, because the result in more than 50 per cent. of cases depended upon the method of application. He regretted that architects had nothing to do with the employment of labour because they could certainly purify the painting trade, if they insisted on every painter having a certificate of efficiency. Of course, it was quite im-

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possible for one specification to cover everything, because more and more paint would have to be designed for special purposes. For instance, in electrical machinery to-day, insulating varnishes and paints were required that ten or fifteen years ago did not exist. New methods were required every day. Already the painting of structural steel used in reinforced concrete had engaged the attention of paint specialists, and to-day structural steel was protected by paint very much better than it was ten to twenty years ago.

A vote of thanks was accorded to the President for his paper, and the Society adjourned.

PRESENTATION TO MR. JOHN SLATER.

THE Council of the Institute, as an expression of personal regard for their former colleague, Mr. John Slater, and of appreciation of his many years' service as a member of their body, have presented him with a pair of handsome silver loving-cups. Mr. Slater has been a Fellow of the Institute for nearly thirty years, and was for twenty-five years a member of the Council. He retired from the latter position at the end of last session, to the regret of his colleagues on the Council and of the very large number of outside members to whom his invaluable services to the Institute in various capacities had been known and appreciated. Mr. Slater has taken part in practically all the numerous activities of the Institute since he first joined as associate in 1879. He has served on most of its committees: the Science Committee, the old Library Management Committee, the Light and Air Committee, the Competitions Committee, the Board of Professional Defence, the Prizes and Studentships Committee, the Finance Committee, of which he was for many years chairman, and various special committees. His knowledge and experience have always been at the service of the Council in the settlement of questions from time to time referred to them. In a paper on "Building Legislation," read before the Institute some years before the London County Council took the matter in hand, he advocated the codification of the various Building Acts relating to London, and the passing of a measure which should lead to better building both from a constructional and a sanitary point of view. Many of his proposals found place in the subsequent Act of 1894. For several years he has been a member of the Tribunal of Appeal under the London Building Act, holding the appointment from the Council of the Institute. Mr. Slater, with the late Mr. Arthur Cates, has had a large share in the initiation and carrying forward of the educational work of the Institute, notably the scheme of progressive examinations. He was a member of the old Board of Examiners from the year 1882 until its supersession in the current year by the present Board of Architectural Education, serving for many years as Vice-Chairman and afterwards as chairman, and rarely missing a meeting. When the Board of Architectural Education was instituted in 1904 he acted as joint hon. secretary, with Professor Reginald Blomfield, A.R.A., and helped to draw up the scheme of education which has since been adopted in the principal institutions of architectural training throughout the country. Mr. Slater still retains his position on the Board, and at the last examination was to be seen, as for so many years past, taking his turn in presiding at the *viva voce* examination of candidates. Mr. Slater represented the Institute on the Lightning Research Committee (1901-1905), and acted as its chairman during the five years of a peculiarly difficult and laborious investigation. His linguistic attainments have often served the Institute in good stead, especially in the entertainment of foreign guests and as representative of the Institute on Congresses abroad. He is one of the Institute's best speakers, and few members are more regular in attendance at the general meetings of the Institute.

ILLUSTRATIONS.

HOUSE IN ELM GROVE, HORNCHURCH.

THIS house is now nearing completion. The walls are cement rendered, floated, stippled and distempered to a buff colour, and stand on a projecting plinth of red brick. The roof is covered with Leicestershire hand-made dark-coloured tiles, and the vertical tiling is executed in bright red sand-faced tiles. The windows are of leaded lights glazed direct into the frames, and with metal casements and slips where opening. The woodwork will be painted white and the ironwork dead black. The contract is 750*l*., and the builder is Mr. W. HOUGHTON, of Southend-on-Sea. Mr. WALTER GRAY ROSS, A.R.I.B.A., is the architect.

CORNER HOUSE, GREAT NELMES ESTATE, HORNCHURCH.

THIS house has been designed for a south-east and south-west corner to catch all the sun possible. The elevations are to be built in cherry-red sand-faced local bricks with diaper in overburnt blue ends, and wooden cornice and sash-windows with boxings exposed and heavy bars. The front-door pilasters and over-door are also in pine, and all woodwork is painted white. The roofs are to be covered with dark-coloured hand-made Leicestershire tiles. The architect is Mr. WALTER GRAY ROSS, A.R.I.B.A.

EAST DOWN, BLANDFORD.

THIS house has been built on high ground a few miles south of Blandford, having fine and extensive views towards the south-west. The materials used externally are dark red hand-made bricks of a varied colour and tone for the walls and Rowlands Castle hand-made tiles for the roofs. The water supply is from a deep well on the property about half a mile from the house, the water being pumped by an oil engine to storage tanks placed over the motor garage on the highest land behind the house. From these the supply is taken by gravitation when required. Artificial lighting is provided by an installation of gas generated by the Safety Gas Light, Ltd., apparatus. Messrs. STEPHENS & SONS, of Exeter, were the general contractors, who also carried out the internal fittings from the architect's designs, and the contracts for motor house, chauffeur's cottage, and entrance lodge. The architect is Mr. EVELYN HELLICAR, A.R.I.B.A.

A VIEW OF THE "HAMBURG-AMERIKA LINIE" OFFICES.

THIS view, taken from the Haymarket Theatre, is an interesting example of the accidental, which we find occurring even in modern architecture.

ARAB FOUNTAIN, JERUSALEM.

THIS ancient and beautiful piece of architecture is situate near the Mosque of Omar, in the Turkish quarter of Jerusalem. It is of Saracenic workmanship, and dates from the time of the Arab dominion over the country, though its history is quite unknown. As will be seen, the monument has been considerably mutilated in places; but, considering its age and exposed position, it is in a wonderful state of preservation, the carved work on the front of the trough being particularly well preserved. Strange though it may seem, it is believed to be the only piece of Saracenic work remaining in the city.

MISSION CHURCH FOR WEST AFRICA.

THE drawing which we publish this week illustrates a small mission church which was proposed to be erected at one of the West Coast stations of Southern Africa. The idea underlying its conception was the possibility of its erection with little or no skilled labour, a good mason and carpenter representing the artisans, the remaining labour being recruited from the natives and other coloured population. The accommodation consists of a nave, small chancel and sanctuary, chapel and vestry. The foundations and walls to plinth level are to be of rough-hewn local stone, the walls carried up in concrete blocks cast in boxes on the ground, and the roofs covered with English tiles. The doors, windows, flèche, and all internal joinery would be made in England and shipped direct, only needing certain labour in putting together and erecting under the guidance of the carpenter. The concrete blocks for walls are left quite rough and are subsequently plastered externally with lime plaster, and internally with clay, finished rough with a wood float, and coated with Duresco. The floors will be covered with wood blocks laid on lime concrete, the chancel, sanctuary, and porch being laid with stone slabs.

It is anticipated that the work will, under the circumstances, take about one and a half years to complete, but it is thought that no difficulty in its erection will be experienced so soon as the necessary funds are forthcoming. The illustration is from a drawing by the architect, Mr. W. R. JAGGARD, A.R.I.B.A.

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The Architect. Dec. 30th 1910.

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"EAST DOWN," BLANDFORD, DORSET

MR. EVELYN ARTHUR HELLICAR, A.R.I.B.A., Architect.

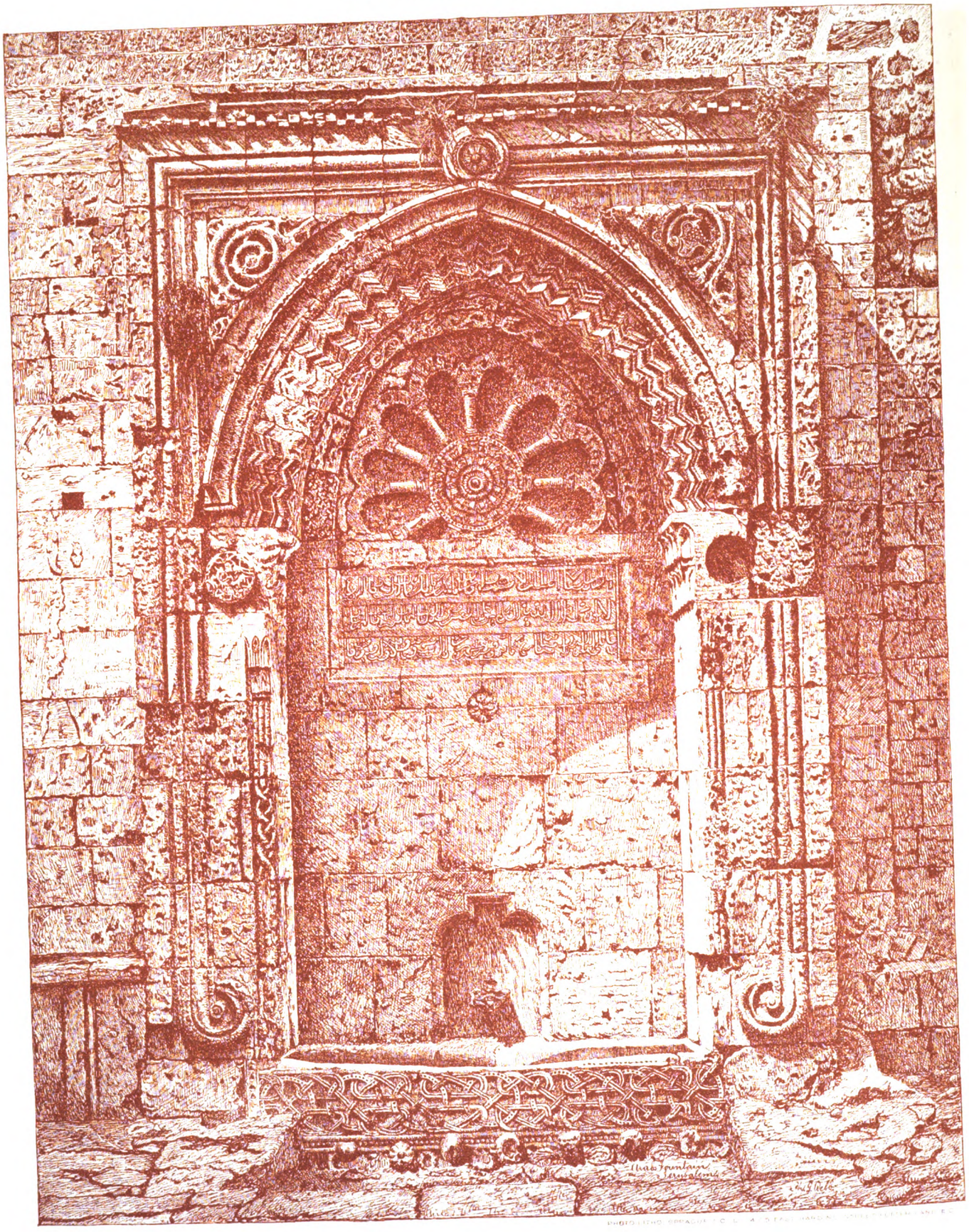
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FAST DOWN, BLANDFORD, DORSET



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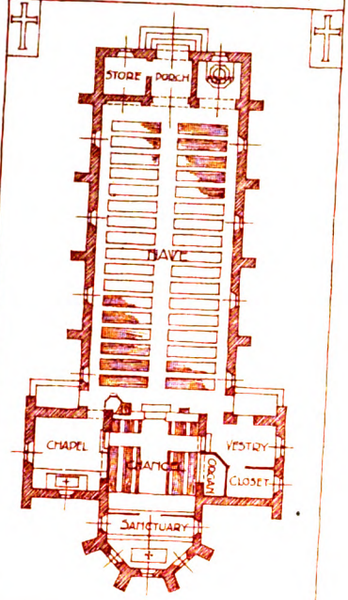
ARAB FOUNTAIN, JERUSALEM.

From a DRAWING by Mr. HENRY G. WEBB.

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A MISSION CHURCH FOR WEST AFRICA

SCALE OF FEET 1 0 1 2 3 4 5





W.R.J. INV. ET. DELT. 1910.

W. R. JAGGARD. A.R.I.B.A.
ARCHITECT.
NEW BARNET. HERTS.

PHOTO-LITHO SPRAGUE & C. L. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

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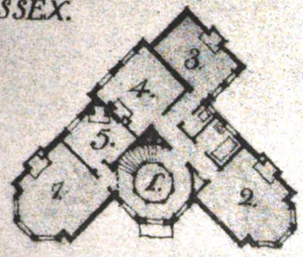
"ANSCHÜTZ" LINIE" OFFICES, FROM THE HAYMARKET, LONDON.

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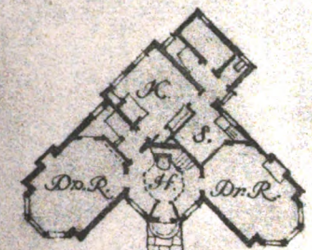
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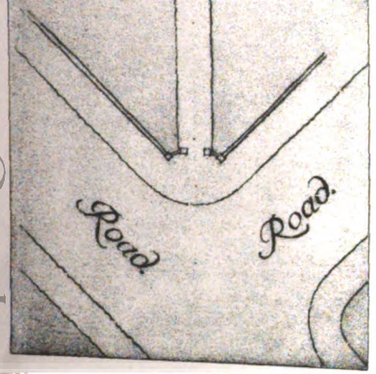
SKETCH FOR CORNER HOUSE, GREAT NELMES, HORNCHURCH, ESSEX.



First Floor Plan.



Ground Plan





W. G. Ross. A.R.I.B.A.
Architect,
1 West St.,
Finsbury Circus, E.C.
1910

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PETROL AIR-GAS.

THEORY AND PRACTICE OF THE NEW ILLUMINANT.

By Professor C. A. M. SMITH, M.Sc.

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(Concluded from page 396.)

The "Solux" Plant.

THIS apparatus (fig. 26) differs in several important respects from other plants placed on the market for the same purpose. Notably, the air-compressor is quite distinct from the gas-generator. The air is compressed to between 4-inch and 8-inch water-gauge in a compressor, and is led through a pipe to the air-meter. This meter consists of a cast-iron casing, inside which a drum rotates under the action of the incoming air, and measures the latter out in definite quantities, registered on an index depending on the adjustment of the instrument and on its rate of rotation. On the same shaft as this drum is a rotating petrol

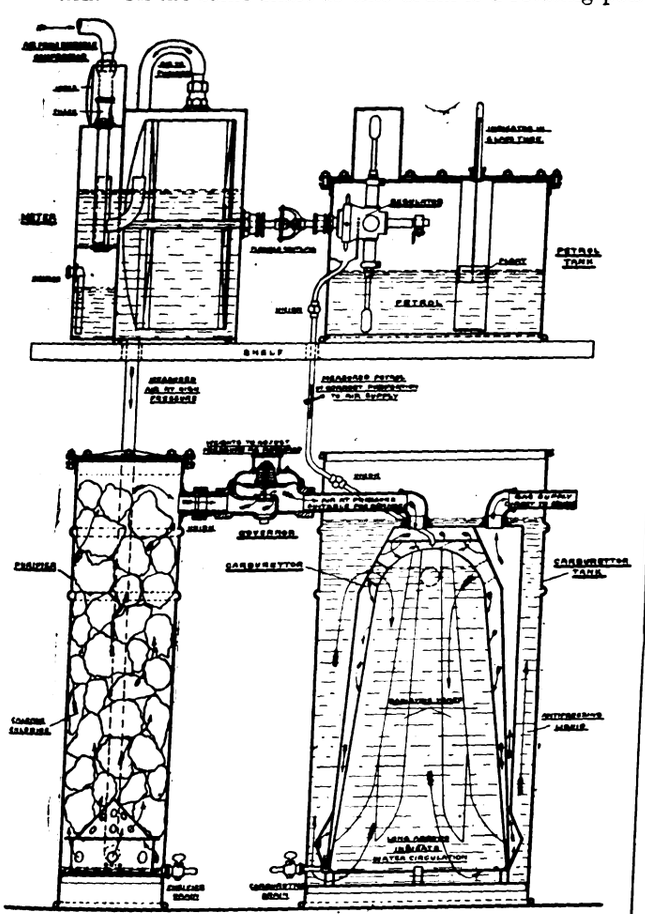


FIG. 26.

meter, which also measures out definite quantities of petrol, so adjusted as to be in the exact proportion to the air necessary to make a correct mixture with the latter for burning. Since the two meters work off the same shaft the mixture is rigidly constant.

The air passes from the meter to a closed vessel beneath, containing calcium chloride, and is thereby thoroughly dried. From the drying chamber the air passes through a loaded copper-disc regulating valve, which adjusts the pressure to that requisite for the gas at the burners. The air next flows into the carburettor, where it meets the incoming petrol, which has been measured out as mentioned above, and a correct mixture is formed and passes away direct to the burners.

With the exception of the compressor, the plant is quite automatic in its action, and adjusts its supply to the demand, for if the lamps are shut off no air can flow, so the apparatus stops; if lamps are opened the blower or other compressing device at once sets up a flow, and any number of lights up to the full capacity can be obtained. The independent blower gives a constant mixture at all speeds, whereas a blower direct-coupled to the generator (which is often met with) fails to do so, owing to variations of wire-drawing and inertia of the air at varying speeds. The actual plant is very simple to take to pieces for repairs, since the blower is separate.

The copper diaphragm governor valve gives an absolutely steady pressure, which can be controlled by the weights forming the load. In this plant the governor is placed on the generator, and so is easily reached; whilst the copper, being unaffected by petrol, is much better than the customary leather washers. The carburettor is of unique design: the incoming air under pressure is caused by suitable vanes to swirl round a ball over which the petrol flows, so that the latter evaporates readily and the mixture is well mixed up and is of uniform density. Freezing up is quite eliminated by making the gas circulate in a chamber whose sides are shaped something like cones one inside the other. The inner cone is hollow, and has radiating vanes, which enable the anti-freezing mixture, in which the whole is immersed, readily to convey heat from the atmosphere to replace that absorbed in evaporation. Since the carburettor is placed after the governor, carburation takes place under the conditions required at the burner, so that the pressure of the mixture does not have to be altered and evaporation in the pipes is avoided. The mixture is so uniform that no receiver is needed, and the absence of water-seals eliminates the danger of the latter blowing and of the gas getting wet. The petrol meter consists of four cups on arms, which, as they rotate, pick up petrol and deliver it through tubes to the hub; by varying the inclination of the cups the quantity delivered may be correctly adjusted once for all. The remarkably steady rate of delivery may be judged from the fact that for forty-eight hours the meter delivered one drop per minute, and kept a peep burning steadily. Had the petrol ebbed for an instant such a minute flame must have gone out.

This plant may readily be set up in several places and supplied with air from a central power station. Water is a very suitable motive agent, and since the compressor is distinct from the generator, there is no chance of contaminating the waste water, which may be used for domestic purposes.

The apparatus is very neat and compact: a 50-light set occupies 32 inches by 18 inches floor-space for the generator and 20 inches by 20 inches for the air-compressor.

The Committee of the Royal Scottish Society of Arts have presented a report approving strongly of the apparatus and its component parts.

Rough Ideas on Cost.

Naturally the architect who is considering an installation in detail will obtain from the makers figures of initial cost of the various plants. It may be well to warn him that in engineering matters the article which costs least may easily be the dearest. Good workmanship is most desirable with these petrol air-gas plants.

The following figures are obtained from the manager of one of the most costly but reliable systems. They are given with confidence that an actual installation will probably work out at a rather cheaper rate.

Taking a 100-light plant, each light of which is supposed to give 50 candle-power, the price for the plant alone is 135*l*. Assuming 100 points for the 100 lights, the total cost of the installation, including piping, fittings, burners, etc., all complete, would be about 270*l*., or 2.17*l*. per light. Roughly speaking, then, we obtain the price as one shilling per candle-power. Another plant to be commended would cost about 10 per cent. less, but the initial cost is not the only matter to be considered.

The firm whose price is quoted above make a fixed rule that no machine is to leave the works until it has

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been running day and night for at least a week. Records are kept of the variations in light during the tests. The plant is run for a period with 100 lights burning, then 20 lights, and so on.

It is fairly obvious that the plant does not cost 135*l.* to make; but, of course, every firm has the expense of patents, tests, etc. It is quite possible that the actual *value* to the customer of a plant less costly to construct than a rival apparatus is really greater. In any case the customer should insist upon being present at the tests, or sending an expert. [It is curious that an architect will often employ a professional man, such as a solicitor or a doctor, but will try to do the work of the consulting engineer himself.]

As for the depreciation on the plant, if we allow 10 per cent. for depreciation and repairs (excluding cost of mantles), we have an annual charge under that heading of 27*l.* per annum. We might obtain an installation at 20 per cent. less capital cost, on which the depreciation and repair would perhaps be 15 per cent.

Running Costs.

With the 100-light plant burning fully we should be obtaining 5,000 candle-power. One gallon of petrol, used efficiently, will produce 15,000 candle-power. We can therefore run our plant about three hours to the gallon of petrol. The average use of the plant would be, at most, five hours nightly. Using petrol at 0.760 density, obtainable at 6*d.* a gallon for lighting purposes, we have the result that the running cost for petrol is 15*l.* per annum roughly.

Of course, a 100-light plant is quite a big installation. A 20-light plant made by the same firm, suitable for a large villa, costs about 45*l.*, and if we take total cost of plant, piping, &c., at 90*l.*, then our running cost for petrol works out at from 3*l.* to 4*l.*, or total costs (including the generous estimate of 10 per cent. for depreciation and repairs) of about 12*l.* to 13*l.* per annum.

It should be remembered that the ordinary 50*l.* a year house in a London suburb would require at most only thirteen lights, and these would never be all used five hours each night for 365 days a year. There would therefore be the equivalent of seven 50-candle-power lights for heating work.

The following results were obtained from experiments at the East London College. For obvious reasons the name of the plant is not given where it is a question of how much light can be obtained per gallon of petrol:—

Test on a Plant of Six Lights (Upright Mantles).

Average candle-power of each light, 38.

Gas consumption of one light (with the others running), 8.42 cubic feet per hour.

Pressure of gas, 1.9 inches of water.

Petrol consumption of plant, .0512 gallons per hour.

Cost of 1,000 *Candle-power Hours.*

Price of Petrol.	
10*d.* per gallon	2.25*d.*
1*s.* 2*d.* per gallon	3.15*d.*
1*s.* 4*d.* per gallon	3.6*d.*

Single light; no others burning. Candle-power taken in four directions, at right angles in a horizontal plane:—

Direction.	Candle-power.
A	40.6*
B	46
C	45.6
D	43

Test of Another Plant.

Inverted bijou mantles.

Consumption of gas (mean), 10.1 cubic feet per hour.

Candle-power (mean), 61.2.

Candle-power per cubic foot per hour = 6.06.

It was not possible to measure the oil consumption of this plant, but from rough calculations it approximates to that given above.

* This direction corresponded with that of the external supporting wire, and it will be seen that this caused a reduction of 11.8 per cent. in the candle-power.

Choice of Plant and System.

To come now to practical considerations, how is the public or its advisers—the architects and engineers—to decide amongst the many systems now on the market which plant is the most reliable and economical to purchase? As we have more or less implied in previous articles, it is probable that when the gas is once made there can be no very considerable difference in economy between any of the methods employed. Given a certain consumption of petrol we have a fixed number of B.Th.U.'s at our disposal. Whether all the air necessary for combustion is mixed with the vapour in the machine itself or whether additional air is added at the burners can make little or no difference to the economy of working, and can only affect to a small degree the reliability of the system. To be candid, the question of safety does not impress us much. To prevent firing back in the pipes to the generator, a fine wire gauze should be fitted over the pipes, behind the mantle, and the best place for this seems to be the burner. Except in the immediate neighbourhood of the generator itself it is doubtful whether air-gas could ever be more dangerous than coal-gas, and who but the most timid persons now trouble themselves very much about the latter? When compared with acetylene there is no necessity to discuss questions of safety. Air-gas is cheaper than acetylene and, given a suitable generator, is in every way superior; so that acetylene can be left out of consideration. Several acetylene firms are marketing petrol air-gas plants. Loud-sounded advertisements about the great safety of air-gas may impress the timid country householder, but can be left out of consideration by the engineer and architect, who should see that the plants they recommend are made and fitted properly.

For these the question turns on ease and simplicity of working and absolute reliability. The apparatus should be such that once set up no further adjustment is required, except at long intervals. It should be sufficient for the householder or his servant to be able to set everything working in a few minutes by means which allow of no mistakes. Some of the apparatus we have inspected would appear first-rate at an exhibition where everything is running smoothly; but there the purchaser does not see the preliminary adjustment, requiring, perhaps, half an hour even by an experienced man. It should not be necessary to have various valves to be adjusted by hand to regulate the mixture. This regulation must be absolutely automatic, and purchasers should have nothing to do with any system requiring, or even having, the means for varying the mixture. If means are provided it is highly probable that they will require regulation every time the machine is started. Petrol spirit from the same company is now a very constant and reliable product. Once having decided what spirit is to be used, the machine should be adjusted for same by the makers, and that should be final.

To make invidious comparisons is a position we do not care to accept, yet nevertheless we feel that the architect and engineer would welcome something more than generalities. For that reason, while not in any way disparaging as bad many other systems, we should give preference to either a plant made by the National Air Gas Company, or the "Solux" plant made in Edinburgh. "The Safety Light Company." The first two plants are in many ways ways radically different, and each has one or two advantages over the other. The plant made by the Safety Light Company must strike one as a sound "engineer's job." That is to say, it does not resemble, as so many other plants do, a combination of a toy engine attached to a string of tin cans. The main structure is of cast iron, and while the machine as a whole is of elegant design, it is nevertheless of a type which one would expect to stand long usage without requiring adjustment or repair. As has already been explained, the petrol is supposed to be measured out, strictly proportional to the air, in definite quantities; though personal experiment has led us to

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believe that the makers might profitably investigate and make experiments to see if it is not possible to ensure that the quantity picked up in the scoop could not vary with the speed of working. We are inclined to think that, as arranged at present, less spirit is picked up in the scoop at high speeds than at low speeds; but some slight modification should overcome this difficulty. If this were done it seems difficult to imagine any better method of ensuring constant mixture. In the "Solux" plant attention seems to have been paid to this point, but as we have not had the opportunity of inspecting the plant personally we cannot state definitely how accurately the patented regulator does this. It is certainly a great improvement if satisfactory. The general method of supplying power employed by the Safety Light Company is to drive the machine by falling weights, and, providing the situation is suitable for a long fall, this seems to us superior to driving by means of a hot-air engine. When all the burners are shut down the machine might be left for six months, and at the end of that time be just as ready for use as at the moment of closing the last tap. Where an odd labourer is available, the question of winding up the weights is not a serous one, although it must be admitted that it is a difficulty.

Where the hot-air engine scores is that it at once provides a source of heat, enabling low-grade or high-density spirits to be used when proper means are taken. This has been done by the National Air Gas Company. We have already described the apparatus made by this firm, and given an outline of the method employed to obtain constant mixture. This method is unquestionably clever and ingenious, and on the criterion that "the proof of the pudding is in the eating" must be admitted to work extremely satisfactorily. Yet one cannot help feeling that if constant mixture is obtained it is almost as much a matter of good luck as good judgment. It will be remembered that the mixture is varied by two means: by the rise of the gasholder and by a thermostat. The first regulation is supposed to depend on the rate of flow of gas through the apparatus; but is it a fact that the position of the gasholder is strictly dependent on the flow of gas? Similarly, is the position of the thermostat regulator strictly dependent on the rate of evaporation? Anyhow, as we have said, the apparatus does undoubtedly work well, whether the theory is strictly scientific or not.

We should imagine that, of the first two plants mentioned above, that made by The Safety Light Company would last longer and show least signs of wear, and in our opinion is, from a mechanical point of view, the most reliable and safest to employ. As an offset against this the National plant is able to use cheaper petrol, and is also of good workmanship. The general principle of the "Solux" plant is much the same as the safety light; but whilst there appear to be certain improvements over the latter, it does not seem to be so solid in appearance. As to the relative first cost, that is a matter which can be learned by any intending purchaser by dropping a line to either firm.

Where the number of lights required remains constant, and first cost is to be kept down, a "Pharoso" plant is well worth consideration. The fire risk is a consideration, but for simplicity this plant must take preference over any except direct-petrol supply; though here again the fire risk must be considerably higher than with ordinary air-gas. For single lights the "Petrolite" lamp deserves attention, and it is surprising that there is not an even wider sale for these lamps than exists at present.

Before deciding to purchase any plant insist on seeing the machine started from cold after fresh petrol has been put in the receiver, and remember that without experience the time required for all to be working would probably be doubled. Try the effect of suddenly turning all the lights out except one. Note whether there is any fluctuation in the lights, and, as we have already stated, have nothing to do with plants requiring a lot of adjustment before everything is working. Inverted mantles are, on the whole, the most satisfactory for this gas, and should be used as far as possible.

General Conclusions.

From what has been already written it will be readily understood that a great deal of ingenuity, patience, and skill has been brought to bear by inventors of the various systems. It will also be noticed that there are many manufacturers marketing plants which clearly must be commercial rivals. With the finance aspect of individual plants the author has no concern, but a few general remarks upon the future may be not altogether out of place.

The evidence supplied by all engineering experience is that new inventions—such as steam engines, steam turbines, &c.—settle down, after fierce competition, to certain standard types. At the present time petrol air-gas seems to be going through that stage in its evolution just previous to such standardisation. It seems impossible that in the struggle for existence all of the many firms can survive. Amalgamation of interests will probably lead to amalgamation of certain good points into one or more types.

The light obtained from petrol air-gas, burnt at a mantle under the proper conditions, is of a beautifully pure white colour. It is quite free from all tinges of blue or green, and owing to the high temperature of combustion the conditions for light production are excellent. With a properly fitted plant combustion is complete, and there is, therefore, no deposit of soot on the ceilings.

It is worth noting that petrol air-gas can be applied to heating, cooking, ironing, &c., as well as to lighting, and there is no doubt that in a country house these auxiliaries are of importance. Some of the makers say that they have installed machines for heating and cooking purposes where electric light had been in use for illuminating purposes. However that may be, the advantages mentioned would influence householders to prefer petrol air-gas to electricity made on the premises.

From a scientific point of view, as well as from a commercial point of view, it would be a great advantage if somebody, such as the Royal Society of Arts, the Royal Institute of British Architects, or the Illuminating Engineering Society, were to appoint a committee to test and report upon all plants entered for competition. This was done in the early stage of gas-engine development, and more recently a competition was held for suction-gas plants. At the present time certain makers are suffering seriously because of the misstatements of rivals in their own industry and other vested interests. Such trials would, of course, occupy a good deal of time, but they would be well worth the time and money spent upon them.

Petrol air-gas has a future before it. There are many places where it will be used. It, like all other inventions, has its limitations. But it has now obtained for itself a position, so that it is a source of employment to many people, and supplies a convenient form of illumination in places where oil lamps and other crude methods would otherwise be used. The fundamental principles of the various processes are simple. In time it is quite probable that evolution will tend to further simplicity of the plants.

THE STRATEGICAL ASPECTS OF ENGLISH CASTLES.*

UNTIL within the last few years the whole story of the genesis and purpose of English castles has been in a state of tangle. This was chiefly on account of the confusion that has existed as to the possible dates of the various classes of earthworks with which England abounds, and in particular of those which are so often associated with our castles.

But in 1901 an active committee, appointed by the Congress of Archæological Societies "to prepare a scheme for a systematic record of ancient defensive earthworks and fortified enclosures," set to work, and was able to draw up and publish, for the first time, a reasonable classification of our earthworks that has, happily, been generally accepted by antiquaries.

* A paper by Mr. W. H. St. John Hope, M.A., Director of the Royal Archæological Institute, read before the United Service Institution on Wednesday, December 14.

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It is accordingly now possible to give a fairly definite date to a particular class of earthwork which forms the basis of a very large and important group of English castles.

Such works consist for the most part of a large or fair-sized conical flat-topped mount, surrounded by the ditch out of which it was thrown up, and accompanied by one or sometimes more attached courts or baileys, protected by lines of bank and ditch. The general plan, of course, depends upon the configuration of the site, and it has been not unusual to take advantage of any natural rise or hill in the formation of the mount, or of cliffs, ravines, or steep banks, as defences of the baileys. The average size varies from 3 to 5 acres.

Upon the mount was set a wooden tower or citadel, approached by a flight of steps, and encircled by a defensive platform of timberwork, and the banks were crested by wooden palisades, like walls of railway sleepers, until such time as mount and banks had settled sufficiently to carry walls of unburnable masonry. Graphic pictures of the Norman castles of this type at Dol, Rennes, and Bayeux, are shown in the Bayeux Stitchwork, and in a fourth example, at Dinan, the inflammable character of the tower is shown by the efforts of men who are trying to fire it.

The only part of the defences which was of stonework was the gatehouse, because it could be built from the first on solid ground, in a gap left for it in the line of earthwork. Good early examples remain at Exeter, Lewes, Tickhill, and Arundel. The palisades right and left of the gatehouse, and those cresting the mounds enclosing the bailey or baileys, were continued across the ditch and up the mount to the tower on top, and so formed with it one continuous ring of defence.

As soon as the earthworks had settled enough to bear their weight, it was usual to replace the lines of palisading by walls of masonry, often with towers at intervals, and the wooden tower on the mount gave place to one of stone. This was generally a ring of walling with interior buildings against it, following the lines of the former wooden defences; but occasonally, Norwich being a notable example, a massive stone tower was raised upon the mount. An excellent illustration, in which the earthworks are strengthened throughout by masonry in place of earlier timber defences, is afforded by Hollar's bird's-eye view of the Royal castle of Windsor.

There was not, of course, from the first any difficulty in setting up stone buildings within the baileys of these castles, like William FitzOsbern's great hall at Chepstow, or Scotland's hall at Richmond, or the equally early chapels at Oxford and Durham.

In a few cases, when the natural strength of the position rendered earthworks unnecessary, or the castle was founded upon rock, it was walled from the beginning, as at Exeter, Richmond, Corfe, Ludlow, and the Castle of the Peak.

But as a rule the timber defences were general, and in many cases they can be shown to have continued well into the thirteenth century. The lower bailey of the King's own castle of Windsor was not walled until 1227, and yet was able to resist successfully for three months the siege by the Barons and their French allies in 1215.

The ditches or fosses that surrounded these castles were, of course, of a magnitude corresponding to the banks and mounts that were dug out of them; hence the bigger the mount or bank the deeper the ditch. In some few cases, as at Hedingham, Basing, and Old Sarum, the site of the citadel was so large that the material thrown up sufficed only to form a bank round a raised central area within, in which was later built a tower of masonry. The ditches were, of course, in themselves a material addition to the defences, and were spanned by wooden bridges before the gates, which could be lifted or removed in time of need.

There is no reason for supposing that these ditches were made or meant to hold water. By far the greater number were always dry, and when water was admitted purposely, as in the case of the pool encircling the castle of Berkhamstead, it was only because the natural conditions were favourable. The primary reason for the formation of a ditch was that it yielded the material for the construction of bank or mount.

It may, perhaps, here be pointed out that it is essential to remember what is meant by the word "castle." This, of course, refers to the entire fortress or stronghold, and not to the chief feature within it, whether mount or tower. People constantly talk of "Rochester Castle" as meaning Archbishop William's great tower, or, with more excuse, of "Colchester Castle," which now consists of the great tower only. Such a mistake is pardonable, perhaps, when the tower, as at London, gives its name to the whole fortress. But, on the other hand, Windsor Castle (for example) is always spoken of correctly with reference to the whole, without meaning "the Round Tower," which is its dominant feature. A castle, then, is the complete fortified enclosure, and it may include a *mota*, "motte," or mount, as at Southampton, Carisbrooke, or Norwich, crowned with a stronghold, polygonal or circular in plan, or built tower-wise; or, instead of such a mount, a *turris*, donjon, or great tower, as at Colchester, London, Porchester, Pembroke, etc.

Many a castle, no doubt, originated in the throwing up of the mount, so that it might settle sufficiently to carry its defences, and never got beyond such initial stage. It is possible that some of these incomplete castles, which consist of a mount only, may have been in course of construction when all further castle-building was forbidden by King Stephen.

Castles based on earthworks of the type described, and with existing added defences in masonry, or traces of such, are to be found throughout the length and breadth of England, and there cannot be any reasonable doubt that they were placed where they stand, at one particular period, by a single dominant power, and in conformity with a definite and rational plan.

Examples are to be found at Norham on the Tweed, Newcastle on the Tyne, Durham, York (where there are two), Clitheroe, and Penwortham in the North. At Launceston, Okehampton, Exeter, Corfe, Winchester, Carisbrooke, Arundel, Lewes, Tonbridge, Rochester, Canterbury, and Dover in the South. From Lincoln, Cambridge, Castleacre, Norwich, Thetford, Bungay, Colchester, and Rayleigh in the east, to Rhuddlan, Chester, Shrewsbury, Wigmore, Hereford, Clifford, and Cardiff in the west.

Now, at what period in the history of Britain was the whole land from the Tweed to the Solent, and from the North Sea and the Straits of Dover to the marches of Wales, in the hands of one dominant power? No one at any time has claimed as Roman the sites of these castles, and there can, therefore, be but one answer: Not until the great fight in 1066 at the place we call Battle, which made the conquest of England possible to the victorious Norman Duke William. And who but he and his lords and their sub-tenants could have thrown up these castles all over the land?

Both the fact and the purpose can, fortunately, be proved by historical evidence.

The word "castel" is first mentioned in the Anglo-Saxon Chronicle under the year 1048:—

"Then had the Welshmen wrought a castle in Herefordshire among Earl Swegen's followers, and wrought every harm and insult to the King's men thereabout that they could"; and the surrender of this castle and of the Frenchmen (or Normans) who were in it was among the things demanded by Earl Godwin in 1052. It will be noticed that both word and thing were new.

On Godwin's return from banishment the same Chronicle states that Archbishop Robert and the Frenchmen who had caused discord between the Earl and the King "took their horses and went, some west to Pentecost's Castle, some north to Robert's Castle."

Pentecost's castle in the west was that at Ewias Harold, and probably, therefore, the Herefordshire castle mentioned in 1048. The castle to the north—that is of London—was apparently that of Robert, son of Wimarc, at Clavering, in Essex. These and maybe some few other early examples were in all probability the work of Norman favourites of King Edward the Confessor.

The only other castle mentioned in the Chronicle, the "castel aet Haestinga Port," said to have been wrought by Duke William himself on his landing in England, is actually depicted in course of construction in the Bayeux Stitchwork, with the inscription—

Iste Ivssit vt Foderetvr Castellvm at Hæstenga Ceastra.

The few castles that had previously been built, such as Ewias Harold and Clavering, were certainly not numerous, for Orderic, in describing the general insurrection of 1068 on the Welsh marches and in Northumbria, says that "the fortresses which the French call castles have been very few in the English provinces, and on this account the English, although they were warlike and bold, were notwithstanding too feeble to resist their foes."

William of Jumièges ascribes the establishment of castles as originating with King William himself, who, he says, "guided by the prudence which he knew how to be mindful of in everything pertaining to a King, visited with extreme care the least fortified parts of his kingdom, and to repulse the attacks of enemies established very strong castles in suitable positions, which he fortified with the best of his soldiers and plenty of pay."

This systematic building of castles was begun by William directly after his coronation, when, as Orderic tells us, he quitted London for a few days and abode at Barking "while

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certain strongholds (*quaedam firmamenta*) were being raised within the City of London." These strongholds were clearly the Baynard's Castle and the Tower of London of later days, and were placed one at either end of the City, on the bank of the Thames, "against the movement of a large and fierce people," says Orderic.

Early in 1067 the King made the progress through parts of his kingdom referred to by William of Jumièges. He also built, according to Orderic, "a strong citadel" within the walls of Winchester, and committed it to the care of William FitzOsbern, whom he had made Earl of Hereford. The castle of Dover was entrusted to the King's half-brother, Odo, Bishop of Bayeux, who was made Earl of Kent.

About the same time King William went oversea to Normandy, and the Chronicle laments how his regents, "Odo the Bishop and William the Earl, remained here behind and wrought castles widely throughout the nation and oppressed poor folk; and ever after that it grew greatly in evil." These castles, therefore, were new things, and offensive and defensive works distinct from a town; they were also the strongholds of individuals, and not of communities.

On William's return from Normandy in 1067 his first act was to march against Exeter, where, having captured the city and suppressed the rebellion there, "he chose a place within the walls for rearing a castle," which is still noteworthy for its early Saxon-looking gatehouse." While the Exeter castle was in building the King continued his march into Cornwall, and so completed the subjugation of the west country. The castles of Launceston, Trematon, and Okehampton probably date from this visit.

Early in 1068, while on his way to York to crush another rising of the English, King William raised castles at Warwick and Nottingham, and, following the surrender of York, he "built a fortress in the city itself, which he delivered to picked knights to guard." On his way south Orderic says that the King built castles at Lincoln, Huntingdon, and Cambridge.

In 1069, the castle at York being besieged during a second rising, the King promptly marched to its rescue, and, having raised the siege, stayed eight days in the city while a second castle was wrought there. The mounts of both castles exist: the one as the base of the later structure known as Clifford's Tower; the other, which faces it across the Ouse, being the lesser known Bail Hill.

Later in the year the English of the North again rose in rebellion, and, aided by the Danes, once more attacked York and demolished the castles, probably by burning their wooden defences. King William for the second time relieved the place, and leaving there a strong force to restore the castles, laid waste the whole country from the Humber to the Tweed. Orderic says that "his castles were scattered over a space of 100 miles," from which we may infer that strong fortresses were left to ensure good order for the future.

On his return William set out for Chester to crush another rising, and built a castle in Chester itself and another at Stafford on his way southwards.

The Abingdon Chronicle also states that at the beginning of William's reign castles were built at Wallingford and Oxford and Windsor and other places "for keeping the kingdom."

The historical statements just quoted are fully confirmed by the Domesday Survey, which, although it says nothing about many that were certainly in existence, refers directly or indirectly to some fifty English and Welsh castles, and in many cases in terms that show they were new. Thus houses are noted as having been destroyed for the sites of castles at Wallingford, Cambridge, Gloucester, Huntingdon, and Lincoln; in this last case to the large number of 166. And at Stamford and Warwick certain houses had become "waste" on account of the castle.

In the manor of Kingston, county Dorset, the King had a hide of land "on which he built the castle of Warham," better known to us as the mighty stronghold of Corfe; and at Rockingham land worth 26*s.* was waste "when King William ordered a castle to be built there." At Stafford there was a piece of land in the manor of Chebsey "on which the King ordered a castle to be built, which now has been destroyed," adds the Survey, probably by burning or dismantling its wooden defences, since the mount and its bailey still exist. The castles of Windsor and Carisbrooke are also described in terms that imply they were new.

Of other castles held by the King *in capite*, the Survey says that Earl Roger "constructed the castle called Muntgumeri," and that at Oswestry, under Earl Roger, "Rainald has made there the castle Luvre," that is "the work." At Rhuddlan, in Flintshire, a sub-tenant of Hugh, Earl of Chester, had "made anew in the manor of Roeland a castle likewise called Roelent." On his manor of Rayleigh, in Essex, "Suen has made his castle"; and the Suffolk Survey states that William Malet "has made his castle at Eye." On the land of Roger of Poitou, between the Ribble and the Mersey, where King Edward held Penwortham (opposite Preston), "there is now a castle."

With five castles within his own earldom the name of William FitzOsbern is associated, and since he died abroad in 1072 they can be approximately dated. These are Clifford, which Earl William built on waste land; the castle of Estrighoiel or Chepstow; Berkeley, in the manor of Ness; Wigmore, built on waste land called Merestun; and Ewias Harold, which the Survey specially particularises as having been "rebuilt" by the Earl "*qui hoc castellum refirmaverat.*" This probably refers to a renewal of the timber defences, which had, perhaps, been burnt by the Welsh.

Lastly, there is a complaint of the English burghers of Shrewsbury that they are still called upon to pay taxes as in King Edward's days, "although the Earl's castle has occupied fifty-one houses and another fifty are waste"; the said houses having obviously been displaced for the site of the mount and bailey castle which still remains there. This castle of Shrewsbury was in existence as early as 1069, when Orderic calls it *præsidium regis*, or the King's stronghold.

Besides the castles already mentioned by contemporary writers, or in the Domesday Survey, there are many more important examples which, from their character and position, must be assigned to the same time, and be looked upon as forming part of the same great offensive and defensive scheme.

Many of these are mentioned in the Survey, including the Royal castles of Monmouth, Canterbury, and Norwich; Launceston and Trematon, in Cornwall; Okehampton, in Devon; Dunster and Montacute, in Somerset; the castle of the Peak, "Pechesers," in Derbyshire; Rochester, in Kent; Caerleon, in Monmouthshire; Richard's Castle, in Shropshire; Arundel, Hastings, Lewes, and Bramber, all in Sussex; Dudley, in Worcestershire; and the Yorkshire examples of Ilbert's castle at Pontefract, Earl Alan's at Richmond, and Earl Roger's castle at Clitheroe (now in Lancashire). The Survey also mentions the castle of Helgot, an under-tenant of Earl Roger of Montgomery, at Stanton, Salop, now Stanton Holgate, where its mount may still be seen.

There are likewise historical or other reasons for including among the castles raised during the reign of the Conqueror or his successor the royal fortresses of Newcastle-on-the-Tyne, Durham, Worcester, Hereford, Dover, Guildford, Hertford, Southampton, Berkhamstead, Oxford, Old Sarum, and perhaps Bristol; also Devizes, Tickhill, Tamworth, Thetford, Bungay, Clare, Ongar, Pleshy, Hinckley, Belvoir, Leicester, Reigate, Tonbridge, Sandal, Castleacre, Basing, Norham, Alnwick, Warkworth, Thorold's Mount at Peterborough, and the mighty tower of Colchester.

From a map which I have prepared it is possible to see how effectually the distribution of these castles all over the country accomplished the conquest of England.

With some few exceptions, a castle was established in every county town, and often supplemented by two or three others in the county itself, where the necessity for them arose. They thus dominate and overawe the towns themselves, while at the same time controlling the roads and waterways. They watch the passes through the hill ranges and mountains, as may be seen by the castles of Lewes and Bramber and Arundel, with their rearguards at Reigate and Guildford and Windsor, and the line along the Welsh border of Rhuddlan, Oswestry, Montgomery, Wigmore, Clifford, Ewias Harold, Caerleon, and Cardiff, with the second line that includes Chester, Shrewsbury, Stanton Holgate, Richard's Castle, Hereford, Monmouth, and Chepstow. They command estuaries and landing-places, and Orderic expressly says that Pevensey and Hastings served at Norman William's first landing as bases for his army and havens for his ships. The turbulent Londoners were kept in check, like the men of York, by the two strongholds within the City, and also by an outlying ring of castles which includes Rochester, Tonbridge, Reigate, Guildford, Windsor, Berkhamstead, Hertford, Ongar, and Rayleigh.

There are, on the other hand, certain districts where these early castles are entirely absent, or but few and far between. None is to be looked for in Cumberland and Westmorland, since these counties then formed part of the Scottish province of Strathclyde. In Lincolnshire, Nottinghamshire, and East Anglia there are very few—apparently because the dense Danish population of those districts was never really subjugated. There is also a curious lack of castles in the district between the Cotswolds and the Chilterns, which is diffi-

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cult to account for, unless we may suppose it to have been so thinly populated as not to be looked upon as formidable.

After the completion of the conquest of England and the restoration of order many castles ceased to be of strategical importance, and were no doubt dismantled and abandoned; while others, which had been planned on a large scale, were reduced in size. Interesting examples of this occur at Carisbrooke and Rockingham, where a large outer bailey has been omitted when the timber defences were replaced by masonry.

The internal troubles of King Henry II.'s reign seem, on the other hand, to have caused a number of castles to be repaired or strengthened, and the Pipe Rolls of the time show that keeps or great towers were added at Orford (1165-67), Bridgnorth (1168-69), Bowes (1170-73), Chilham (1170-73), Hertford (1170-73), Hastings (1171-74), Richmond (1171-72), and Newcastle-on-Tyne (1171-77), Canterbury (1172-74), Oxford (1172-73), the Castle of the Peak (1175-76), Tickhill (a ten-sided tower on the mount, 1178-80), Northampton (1181-83), and Dover (1181-88). Of these it is interesting to note that Newcastle and Dover were the work of the same architect, as we should call him, who is in the one case called Maurice the mason, and in the other Maurice the *ingeniator* or engineer. Ralph the mason was the builder of Chilham. The huge tower of Norwich is also a work of Henry II.'s reign, and it and the contemporary tower at Castle Rising are the work of one architect. The earlier towers of Rochester (which was built between 1123 and 1135) and Hedingham must also have been designed by the same man, and it is interesting to see how in the Kentish example he dealt with Caen stone and Kentish rag, and in the Essex tower with concrete faced with Barnack ashlar. There cannot also be any doubt that the enormous tower of Colchester, built in the closing years of William the Conqueror, was planned by the same engineer who built the Tower of London under Bishop Gundulf for William Rufus. These two great towers, it may be remarked in passing, are the earliest of their types in this country, and it would be interesting to know of any proved older examples in Normandy which could have suggested them.

Time will not permit me to do more than refer briefly to one or two other groups of castles, of more or less local character.

The most noteworthy of these is the fine series, of an entirely new type, which includes Harlech, Carnarvon, Beaumaris, and Conway, Criccieth, Rhuddlan, and Flint, built by King Edward I. to keep in order the Welshmen whom he had conquered but not subdued.

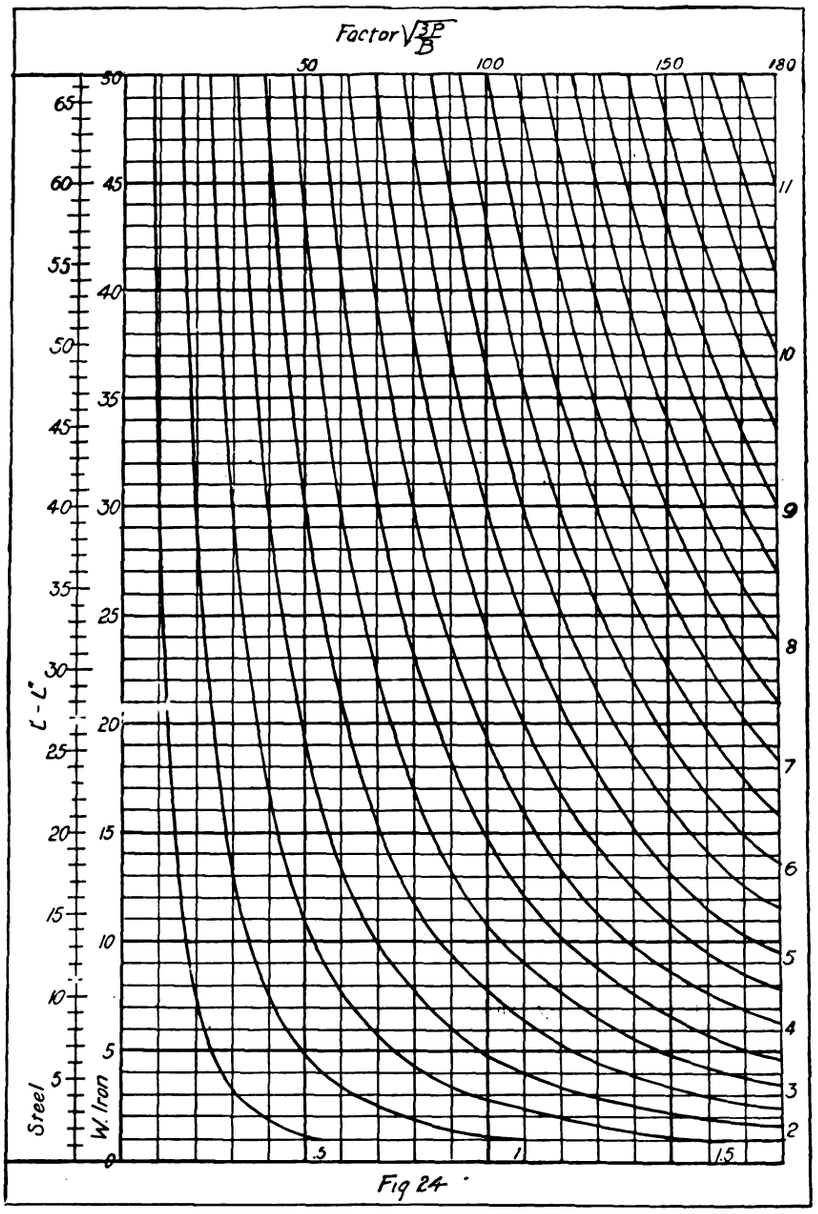


Fig 24.

These are of interest as being almost the last castles proper that were raised in this country; changes in methods of warfare, the introduction of artillery, and last, but not least, the final peaceful settlement of the whole of England and Wales, making it unnecessary to build more.

One other group may also be mentioned, though strictly speaking they are not castles at all, but defensible houses composed of ranges of chambers and towers built about a courtyard, which, therefore, combine the elements of the foregoing strongholds. They include Bolton in Wensleydale, one-half of which was contracted for in 1378; Sheriff Hutton (1381) and Wressle, both in Yorks; and Bodiam in Sussex (1385); also Middleham, which encloses a fine Norman great tower; and Lumley, the latest of the series, begun after 1389.

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These were, of course, private houses, and not the property of the King.

Such later attempts as the line of forts built by King Henry VIII. along the south-east coast, from Deal to Hurst Castle, against a threatened French invasion, and the still more recent series of martello towers dotted along much the same line in preparation for Napoleon's boasted visit, can hardly be regarded as England's castles, and are more closely paralleled by the blockhouses devised by Lord Kitchener during the Boer war.

A STUDY OF BASE AND BEARING PLATES FOR COLUMNS AND BEAMS.

By N. CLIFFORD RICKER, Professor of Architecture, University of Illinois.

(*Concluded.*)

IT will be seen that fig. 24 contains two vertical scales, one for steel with fibre stress of 16,000 lbs. per square inch and the other for wrought iron with fibre stress of 12,000 lbs. per square inch. Fig 25 likewise has two vertical scales corresponding to fibre stresses of 3,000 lbs. and 2,500 lbs. per square inch.

XVI.—ADDITIONAL EXAMPLES OF THE USE OF THE TABLES.

1. A bearing plate is 12 inches wide and rests on a 13-inch wall; it supports a load of 15 tons (30,000 lbs.) transmitted by the end of a girder 12 inches wide. Safe pressure of plate on masonry = 100 lbs. per square inch. Safe fibre stress for cast iron = 2,500 lbs. per square inch. Required its thickness.

$$\frac{15 \times 2{,}000}{100 \times 12} = 25.0 \text{ inches} = \text{length of the plate,}$$

$$nk = \frac{25 - 12}{2} = 6.5 \text{ inches} = \text{projection of end beyond side of girder;}$$

By formula 17,

$$t = \frac{1}{40.8}\sqrt{\frac{Pnk}{d}} = \frac{1}{40.8}\sqrt{\frac{30{,}000 \times 6{\cdot}5}{12.0}} =$$

3.12 inches, the thickness beneath the girder. The plate may be tapered from the girder to any desired thickness at its ends without danger, since its fracture section is always rectangular.

If the safe fibre stress be taken = 3,000 lbs. per square inch

$$t = \frac{40.8 \times 3.12}{44.7} = 2.85 \text{ inches, say, } 2\tfrac{7}{8} \text{ inches.}$$

Or by the table, fig. 21, a plate 17.25 inches square would be required.

Hence, length $\frac{(17.25)^2}{12} = 25.0$ inches, as before.

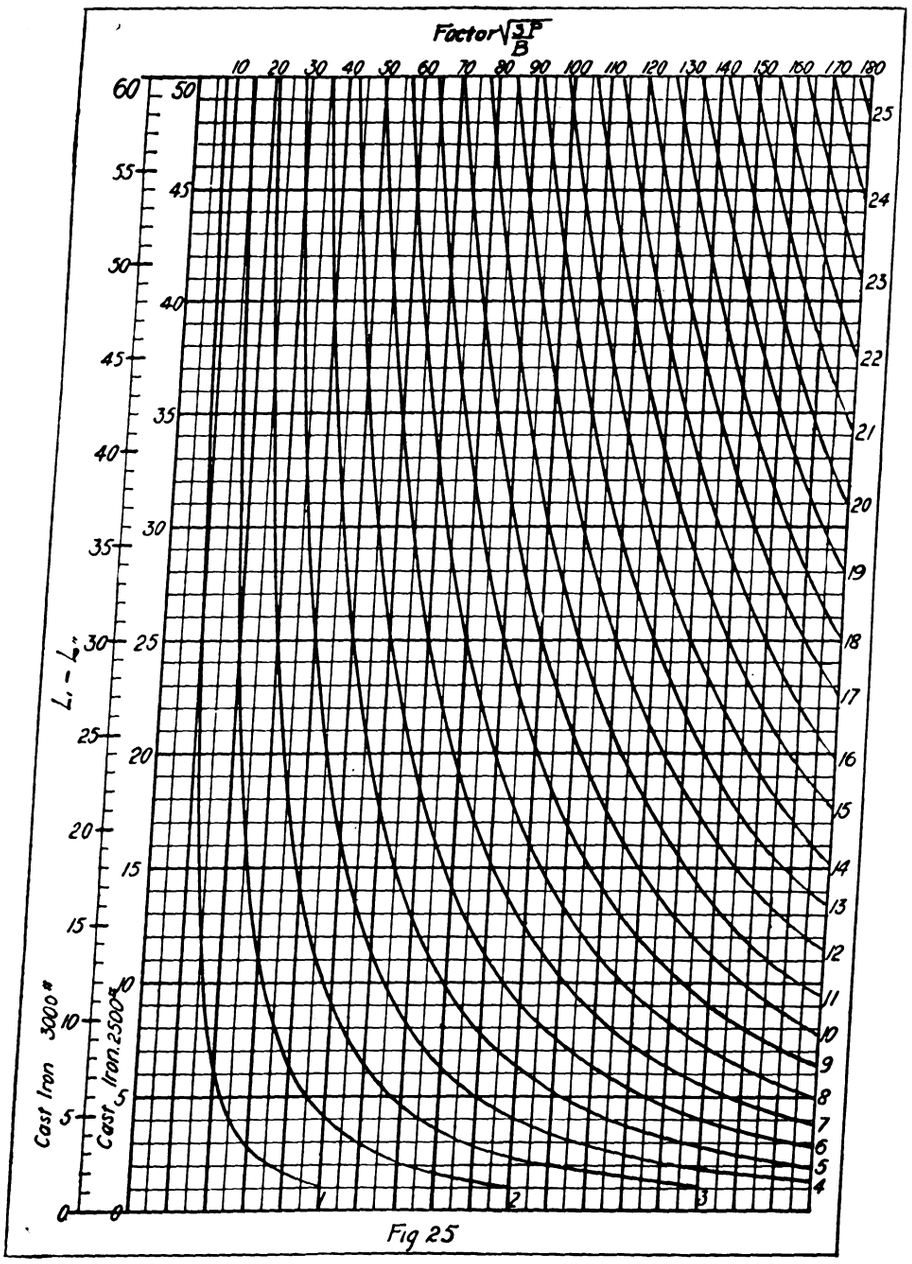


Fig 25

Also by the table, fig. 23, the factor $\sqrt{\frac{3P}{B}} = 86.0$.

$$L' = \frac{25.0}{4} = 6.25; \quad L'' = \frac{12.0}{4} = 3.00;$$

$$L' - L'' = 6.25 - 3.00 = 3.25 \text{ inches.}$$

By the table, fig. 25, $t = 3\frac{1}{8}$ inches as before.

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Therefore, the graphical tables may also be used for bearing and wall plates.

2. A square base plate transmits a load of 50 tons to masonry with a safe resistance of 150 lbs. per square inch. Safe fibre stress 3,000 lbs. per square inch. A column 7 inches external diameter and 1 inch thickness of metal stands on this plate.

By the table, fig. 21, 22.7 inches = side of plate, and $n = 1.12$.

By the table, fig. 23, $\sqrt{\frac{3P}{B}} = 114.5$.

$L' = 5.68$ inches; $L'' = 1.91$ inch by fig. 12. $L' - L'' = 3.76$ inches.

By the table, fig. 25, $t = 3\frac{5}{8}$ inches $= 3.31$ inches.

Assuming $\frac{t'}{t} = 0.25$, which is a commonly employed ratio, and $n = 1.12$, @ = 73.5 by the table in fig. 16.

By formula 12,

$t = \sqrt{\frac{100}{73.5}} \times 3.31 = 3.86$ inches = thickness at middle, and

$t' = 3.86 \times 0.25 = 0.97$ inch thickness at edges.

3. A circular base plate transmits a load of 175 tons to masonry with a safe resistance of 175 lbs. per square inch. A column of metal 12 inches in diameter and $1\frac{1}{4}$ inch thick stands on this plate.

By the table, fig. 21, 50.5 inches = diameter of the plate; $n = 1.60$.

By the table, fig. 23, $\sqrt{\frac{3P}{B}} = 144$. Also $L' - L'' = 7.29$ inches.

By the table, fig. 24, $t = 3.10$ inches for a steel plate.

$t = 3.50$ inches for a wrought-iron plate.

By the table, fig. 25, $t = 7.05$ inches for cast-iron plate, $f =$ 3,000 lbs. per square inch.

$t = 7.75$ inches for cast-iron plate, $f =$ 2,500 lbs. per square inch.

Assuming

$\frac{t'}{t} = 0.25$, and as $n = 1.60$, by the table, fig. 16, @ = 71.0.

Then

$t = 7.05 \times \sqrt{\frac{100}{71}} = 8.37$ inches = thickness beneath column, $f = 3{,}000$ lbs.

$t = 7.75 \times \sqrt{\frac{100}{71}} = 9.20$ inches = same, for $f = 2{,}500$ lbs.

Therefore

$t' = 2.09$ inches in the first case and 2.30 inches in the second.

4. Assume that in the last case the plate is to be square and that the safe resistance of the masonry is but 90 lbs. per square inch.

In the same manner as before, we easily find:—

Side of plate = 62.2 inches; $n = 2.09$.

Factor $\sqrt{\frac{3P}{B}} = 130$.

$t = 3\frac{5}{8}$ inches for a steel plate.
$t = 4\frac{3}{4}$ inches for a wrought-iron plate.
$t = 8\frac{3}{8}$ inches for cast-iron plate, $f = 3.000$ lbs.
$t = 9\frac{1}{8}$ inches for same with $f = 2{,}500$ lbs.

Assuming $\frac{t'}{t} = 0.25$, and for $n = 2.09$; @ = 69.5.

Then $t = 10.00$ inches thickness at middle in the first case and = 10.95 in the second. The corresponding values for t' are 2.50 and 2.74 inches.

5. A built steel column is composed of two 15-inch channels, one 15-inch I, and two 16 × $\frac{3}{4}$-inch plates. It stands on a circular cast-iron base plate, which rests directly on a cylindrical sunken foundation pier of Portland cement concrete, to which the plate transmits a load of 500 tons (1,000,000 lbs.). Maximum safe fibre stress in cast iron is taken at 2,500 lbs. per square inch. Safe resistance of the concrete pier is 175 lbs. per square inch. Let $\frac{t'}{t} = 0.20$.

Required least safe diameter and thickness of the cast-iron plate.

In this case, $\frac{1{,}000{,}000}{175} = 5{,}714.3$ square inches, area of plate.

$d = \sqrt{\frac{5.714}{.7854}} = 85.3$ inches = diameter of the plate; $n = 2.17$.

By formula Sec. VII., $L' = 85.3 \times 0.2122 = 18.1$ inches.

For the given cross section of the steel column, fig. 26, there may readily be found by the usual graphical methods:—

$L' = 5.84$ inches about the axis CD.
$L' = 3.78$ inches about the axis AB.

Taking the smaller of these values and applying formula 32,

$$t = \frac{1}{28.9}\sqrt{\frac{P}{B}(L' - L'')} = \frac{1}{28.9} \times \sqrt{\frac{1{,}000{,}000}{85.3}(18.10 - 3.78)} = 14.18 \text{ inches.}$$

Assuming $\frac{t'}{t} = 0.20$, and for $n = 2.17$, by table in fig. 16,

@ = 68.0.

Then $t = \sqrt{\frac{100}{68.0}} \times 14.18 = 17.20$ inches = thickness under column, and $t' = 17.2 \times 0.20 = 3.44$ inches = thickness at edge of plate.

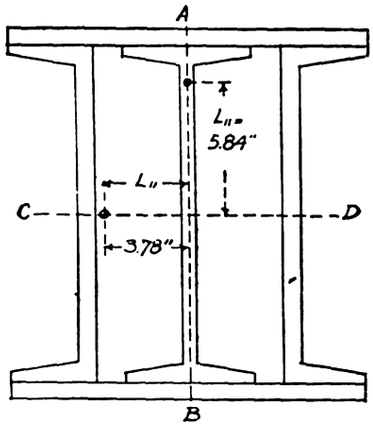


FIG. 26.

Such a solid plate would be more simple and more easily set in place, and it might also be cheaper than the usual arrangement consisting of a cast-iron ribbed base plate or stool above a layer of short steel 15-inch I-beams, which are set on the top of the concrete pier. This pier would also here require to be not less than 8 feet 6 inches in diameter at the top.

These examples show that simple formulas and tables have been here devised, making the calculation of safe plain bearing and base plates a very simple matter.

COMPETITION NEWS.

RUISLIP.—The award in the competition for the plan of the new town of Ruislip Manor, Middlesex, has been made by the assessors, Sir Aston Webb, C.B., R.A., and Mr. Raymond Unwin, F.R.I.B.A., as follows:—First, Messrs. J. & A. Souter, Westover Road, Wandsworth; second, Mr. George Hornblower, F.R.I.B.A., 2 Devonshire Terrace, W.; third, Mr. H. R. Gardner, Reigate Road, Leatherhead.

THE results of the R.I.B.A. examinations for November have been published. The Preliminary examination, qualifying for registration as Probationer R.I.B.A., was held in London and the provincial centres on November 14 and 15. Of the 125 candidates admitted, claims for exemption from sitting were allowed to the number of thirty, and the remaining ninety-five candidates were examined with the result that fifty-nine passed. The Intermediate examination, qualifying for candidature as Student R.I.B.A., was held in London and the provincial centres on November 14, 15, 17 and 18, when 107 candidates were examined, with the result that forty-six passed and sixty-one were relegated. The Final and Special examinations were held in London from November 24 to December 2. Of the 122 candidates examined, fifty-four passed, and sixty-eight were relegated in various subjects.

AT a meeting of the Archdeacons and Rural Deans of the Diocese of Southwell, held in Nottingham, the following diocesan surveyors were elected for the ensuing five years:—Mr. G. C. Aitchison, of Messrs. Smith-Woolley & Wigram, South Collingham, Newark; Mr. G. F. Barnes, Chesterfield; Mr. P. H. Currey, of Messrs. Currey & Thompson, Derby; Mr. A. E. Heazell, of Messrs. Heazell & Sons, Nottingham; Mr. M. Hunter, of Messrs. Hunter & Woodhouse, Belper; Mr. W. H. Pain, Bingham, Notts.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

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The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

ASHTON-ON-MERSEY.—Architects practising within ten miles of Sale desirous of competing for proposed Sunday schools in connection with the Wesleyan Chapel are invited to communicate with Mr. J. O. Barrow, Barker's Lane, Ashton-on-Mersey.

BELFAST.—Sept. 5.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

EDINBURGH.—July 9.—The Corporation invite designs for the erection of a new hall in Lothian Road, Edinburgh. They have appointed Sir Aston Webb, C.B., R.A., as assessor, Mr. J. A. Williamson, A.R.I.B.A., City Chambers, being associated with him. Three premiums are offered. Particulars and plans of the site will be supplied to competitors on payment of two guineas, which will be returned on receipt of a design in accordance with the conditions. Should architects, on receipt of the particulars, not desire to compete, the deposit will be returned, provided the papers are returned within four weeks. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

WINCHESTER.—July 25.—Architects practising in Hampshire. Designs for elementary school buildings to accommodate 330 children. Premiums of 50*l.*, 30*l.*, and 20*l.* Particulars from Mr. Thomas Holt, town clerk, Guildhall, Winchester.



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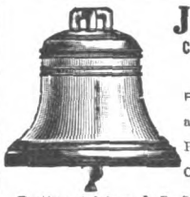
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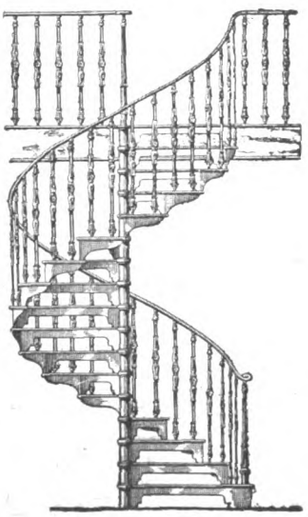
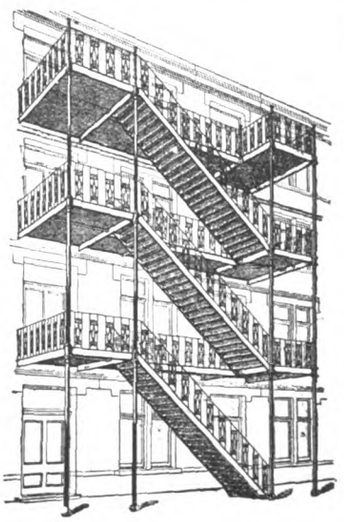
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CONTRACTS OPEN.

AMBLE.—July 12.—For the various works required in alterations to the old public schools, for proposed Council chamber, offices and public hall, in Church Street. The Surveyor's Office, Amble.

BAILDON.—July 9.—For the construction of about 250 yards of strong retaining wall on the river bank at the Roberts Park. Mr. J. Myers, surveyor, Baildon, Yorks.

BELFAST.—July 5.—For erecting an engine and accumulator house, also water storage cistern, at the Abbey auxiliary workhouse, Whiteabbey. Charge 10*s*. Mr. Joseph W. Robb, clerk, Workhouse.

BELFAST.—July 9.—For building a warehouse in Queen Street, Belfast. Deposit 2*l*. 2*s*. Messrs. Watt, Tulloch & Fitzsimons, architects, 77A Victoria Street, Belfast.

BISHOP AUCKLAND.—July 6.—For alterations to certain wards at the workhouse. Mr. F. H. Livesay, architect, Bishop Auckland.

BOWNESS-ON-SOLWAY.—July 6.—For the various trades required in the erection of hall, billiard and reading rooms. Mr. H. H. Hodgkinson, architect, 64 Lowther Street, Carlisle.

BRISTOL.—July 9.—For (1) pointing front walls, repairing chimney stacks, repairing stone dressings, and exterior painting, &c.; and (2) the plastering, painting, &c., of the male sick wards at the Eastville workhouse. Mr. J. J. Simpson, clerk, St. Peter's Hospital, Bristol.

BUCKIE.—July 4.—For mason, carpenter, slater, plumber, plasterer, painter, and glazier works of alterations on property at 84 Main Street, Buckie. Mr. Wm. Hendry, architect, Buckie.

BURTON PEDWARDINE.—July 9.—For alterations and repairs to the Burton Pedwardine Council school. The County Surveyor, 53 High Street, Grantham.

CHESTERFIELD.—July 14.—For the enlargement of Chesterfield post office, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l*. 1*s*. The Postmaster, Chesterfield, or H.M. Office of Works, Storey's Gate, London, S.W.

CHIPPING ONGAR.—July 6.—For the execution of (a) general painting and repairs, (b) tiling and roof repairs, and (c) alteration to kitchen in administrative block at the children's homes at Chipping Ongar, Essex, for the Guardians of Hackney Union. Mr. Frank R. Coles, clerk, Guardians' Offices, Sidney Road, Homerton, N.E.

DARENTH.—July 6.—For erection of work-rooms at Darenth Asylum, Dartford, Kent. Mr. T. W. Aldwinckle, 20 Denman Street, London Bridge, S.E. Send 2*l*. deposit to the office of the Metropolitan Asylums Board, Embankment, E.C.

DARTMOUTH.—July 7.—For laying new floors in the boys' department of the Dartmouth Council school. Mr. Robert W. Prideaux, correspondent, Hanover Square, Dartmouth.

DEWSBURY.—July 14.—For all or any of the works required in the erection of Batley Carr Council school. Messrs. Holtom & Fox, architects, Corporation Street, Dewsbury.

DEVONPORT.—July 13.—For the erection of a shelter in Devonport Park. Mr. J. F. Burns, borough surveyor, 29 Ker Street, Devonport.

DURHAM.—July 19.—The Durham County Council invite sole tenders for (1) Cassop new school and extensions at Horden Colliery, Mr. W. Rushworth, Shire Hall, Durham; (2) alterations at Fulwell Council school, Mr. F. E. Coates, Shire Hall, Durham; (3) removal of the iron school, accommodation about 500 scholars, from Shotton colliery, and re-erection of the same at Blackhall Rocks. Mr. F. E. Coates, Shire Hall, Durham.

ELLAND.—July 13.—For the mason, carpenter and joiner, plumber and glazier, plasterer and slater, painter, and electric engineer trades in erection of two semi-detached villas, Victoria Road. Mr. Henry Thompson, architect and surveyor, Central Chambers, Elland, Yorks.

FOOTSCRAY.—July 4.—For the enlargement of Langlands Council school at Footscray, Kent. Deposit 1*l*. Apply after June 13 to Mr. W. H. Robinson, M.S.A., architect to the Kent Education Committee, Caxton House, Westminster, S.W.

GLASGOW.—July 7.—For (1) slater work and (2) plumber work required on roof of St. George's Church, Buchanan Street, for the Corporation. The Office of Public Works, 64 Cochrane Street, Glasgow.

GRAVESEND.—July 5.—For alterations, additions, and decorations to No. 4 Woodville Terrace. The Borough Surveyor, Town Hall, Gravesend.

HEBDEN BRIDGE.—July 8.—For the following works, viz.:—Cragg Vale Council school (cement rendering to head master's house; Oldtown and Scout Road Council schools), painting and whitewashing, &c. Mr. Richard H. Whitworth, divisional clerk, Education Offices, Sowerby Bridge.

HEIGHINGTON.—July 18.—For alterations at the Wesleyan chapel and schools. Messrs. Kitching & Lee, architects, Houndgate Chambers, Darlington.

IRELAND.—July 6.—For building thirty-five labourers' cottages at Shankill, for the Rathdown No. 1 Rural District Council. Mr. Patrick Cunniam, clerk, Loughlinstown.

IRELAND.—July 9.—For the rebuilding of Aughavannagh Bridge, including the removal of the old arch, &c., and the erection of a temporary wooden bridge, for use during rebuilding, for the Wicklow County Council. Cost not to exceed 330*l*. The County Surveyor's Office, Wicklow.

KEIGHLEY.—July 5.—For erection of offices and additions to Park Works. Messrs. John Haggas & Sons, architects, North Street, Keighley.

LOCKERLEY.—July 9.—For the internal renovation of the Lockerley endowed Church of England school. Rev. J. P. May, The Rectory, Lockerley, Romsey, Hants.

LONDON.—July 5.—For (a) works of alteration at and painting, &c., of Turnham Green school, and (b) painting, &c., of certain schools of the Council. Mr. Edward Willis, A.M.I.C.E., surveyor, Town Hall, Chiswick.

LONDON.—July 5.—For certain plastering work in the "O and P" ward at the Sick Asylum, Devons Road, Bromley-by-Bow. The Engineer and Superintendent of Labour at the Asylum, Devons Road, Bromley-by-Bow.

LONDON.—July 6.—For alterations and additions to certain staff buildings at South Wharf Smallpox Shelter, Rotherhithe, S.E., for the Metropolitan Asylums Board. Deposit 1*l*. Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, the Office of the Board, Embankment, E.C.

LONDON.—July 6.—For (a) sundry alterations to the town hall, (b) internal painting and decorating of the town hall, Spa Road, Bermondsey. Mr. R. J. Angel, M.I.C.E., borough surveyor, Town Hall, Spa Road.

LONDON.—July 6.—For repairs to certain chimney stacks and for constructing an escape staircase at the North-West Block at the workhouse, Hazelville Road, Hornsey Rise, N. Mr. F. J. Smith, F.R.I.B.A., Parliament Mansions, Victoria Street, S.W.

LONDON.—July 12.—For painting, cleansing, repairs, &c., of public buildings, for the West Ham Town Council. Deposit 1*l*. Mr. John G. Morley, borough engineer, Town Hall, West Ham.

LONDON.—July 14.—The Commissioners of H.M. Works and Public Buildings invite constructional schemes and tenders based thereon for the erection in reinforced concrete of vaults and retaining wall for the Public Offices extension, Westminster, S.W. Any system or systems of construction may be adopted for the whole or part of the work. Deposit 2*l*. 2*s*. H.M. Office of Works, Storey's Gate, S.W.

LONDON.—July 15.—For strengthening the floor of the Council Chamber at the Islington Town Hall, Upper Street, by means of stanchions and rolled-steel joists. Deposit 1*l*. 1*s*. Mr. J. Patten Barber, borough engineer, Town Hall, Upper Street.

LONDON.—July 28.—For the construction of exit iron staircases and the necessary structural alterations in connection therewith at the St. George's Workhouse, Mint Street, Borough, S.E. Deposit 1*l*. 1*s*. Mr. A. J. Wade, architect, 104 Harvist Road, Brondesbury, N.W.

LOWESTOFT.—For certain repairing, cleaning, renovating, and painting work in various schools in the borough during the summer holidays. Mr. G. T. Knights, clerk of works, 44 Milton Road, Lowestoft.

MAIDSTONE.—July 5.—For the erection of offices, workshops, stores, &c., at Roger's Wharf, St. Peter's Street Deposit 3*l*. 3*s*. The County Surveyor, West Borough Chambers, Maidstone.

MANCHESTER.—July 4.—For pointing chapels and walls at Philips Park cemetery. Deposit 1*l*. 1*s*. The City Architect, Town Hall, Manchester.

MANCHESTER.—July 6.—For erection of a corrugated iron building at the Stanley Grove municipal school, Longsight. Deposit 1*l*. 1*s*. The Education Offices, Deansgate, Manchester.

MATLOCK.—July 8.—For certain alterations and additions to Smedley's Hydropathic, consisting of thirty-two bedrooms, &c. Tenders are invited for work connected with the following trades:—Mason, bricklayer, concretor, excavator and drainage, joiner, plasterer, plumber, glazier and painter. Apply after June 24 at the Secretary's Office, Smedley's Hydropathic, Matlock.

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MEXBOROUGH.—July 5.—For the excavator, mason, bricklayer, joiner, slater, and plasterer work in connection with erection of the Park Hotel. Mr. Harold T. Raper, architect and surveyor, Oakwell Brewery, Barnsley.

MEXBOROUGH.—July 8.—For the following work, for the West Riding Education Committee, viz.: Mexborough new mixed and infants' school, and special subjects block (builder, joiner, slater, plumber, plasterer, painter). The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

NELSON.—July 9.—For the various works required in connection with car shed extension. Mr. W. Shackleton, A.M.I.C.E., borough engineer and surveyor, Town Hall, Nelson.

NORTH CURRY.—July 7.—For erection during August of a new class-room at the National school in the village of North Curry, Somerset. Mr. Cecil Dennis, North Curry.

OAKENSHAW.—July 6.—For new Wesleyan Sunday school at Oakenshaw, Yorks. Send names to Mr. E. Vincent King, A.R.I.B.A., architect, 24 Westgate, Dewsbury.

PADIHAM.—July 9.—For the construction of a new bridge in stone and brickwork over Lodge River, in Dryden Street, for the Padiham Urban District Council. Mr. J. Gregson, surveyor, Council Chambers, Warrington.

PENRYN.—July 9.—For proposed improvements and alterations to Penryn Council school, Cornwall. Mr. Sampson Hill, architect to the committee, Green Lane, Redruth.

ROCHDALE.—July 13.—For erection of workshops and boundary fence at the workhouse, Dearnley. Mr. F. H. Shuttleworth, architect, Littleborough.

SCOTLAND.—July 5.—For the mason, carpenter, slater, and plasterer works of (1) additions to farm dwelling house at Bardon, Birnie; (2) alterations on farm dwelling house at Trochail, Birnie; and for the mason, carpenter, and slater works of (3) new steading at Moor of Linksfield, Elgin; (4) new cattle court and reroofing part of steading at Hangingfolds, Birnie, on the Seafield Estates. Mr. David T. Samson, factor, Seafield Estates Office, Elgin.

SCOTLAND.—July 7.—For mason, joiner, slater, plumber, plaster, and painting works of additions to the Stair Public school. Mr. Allan Stevenson, architect, 14 Cathcart Street, Ayr.

SCOTLAND.—For the following works in connection with erection of a new academy at Hamilton, for the Hamilton School Board:- (1) Mason and brick, (2) carpenter and joiner, (3) iron and steel, (4) plumber, (5) plaster and cement, (6) glazier, (7) tile, (8) steam boilers, heating and ventilation, (9) painting, (10) slater. Deposit 1*l.* 1*s.* each schedule. Messrs. Alex. Cullen, Lochhead & Brown, architects, Hamilton.

SHERBURN HILL.—July 8.—For alterations and additions to the Workmen's Club, Sherburn Hill, Durham. Deposit 10*s.* Mr. H. T. Gradon, architect, 22 Market Place, Durham.

SHIPTON BELLINGER.—July 20.—For the erection of a Council school for ninety-nine children, and teacher's house. Deposit 2*l.* 2*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

SOLIHULL, NEAR BIRMINGHAM.—July 11.—For alterations to laundry buildings, &c., at the workhouse, Solihull, for machinery, &c. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

SOUTHEND-ON-SEA.—July 7.—For the construction of the Southchurch Esplanade extension. Approximately 1,260 feet in length, 69 feet in width, together with an apron wall. Deposit 5*l.* 5*s.* Mr. Ernest J. Elford, M.I.M.E., borough engineer, Municipal Buildings, Southend-on-Sea.

SOUTHEND-ON-SEA.—July 4.—For alterations and additions to Leigh Road and Brewery Road Council schools. Deposit 1*l.* 1*s.* Mr. Ernest J. Elford, C.E., borough engineer and surveyor, Municipal Buildings.

SOUTH SHIELDS.—July 8.—For the construction of an engineer's office, at the South Pier. Deposit 1*l.* Mr. N. G. Gedye, chief engineer to Tyne Improvement Commission, South Pier Works, South Shields.

STOCKPORT.—July 4.—For the labour and materials required in carrying out renewals and repairs to the roof, &c., of the covered market. Mr. John Atkinson, A.M.I.C.E., borough surveyor, Town Hall, Stockport.

TROWBRIDGE.—July 11.—For work to be done in taking down and re-roofing a portion of the county offices, for the Wilts County Council. Mr. J. George Powell, county architect and surveyor, Trowbridge.

TRURO.—July 4.—For erection of new piggeries, earth closet, sinking well, coal-house, also general repairs to dwelling house, at Treskinnick, and Ney Downs Farms, Poundstock, Bude, for the small holdings committee of the Cornwall County Council. Mr. S. G. Carnell, county land agent, Public Rooms, Truro.

TRURO.—July 4.—For erection and completion of a new farm house at Maiden Green Farm, near Truro. Mr. Morley B. Collins, architect, Clinton Road, Redruth.

TRURO.—July 5.—For the construction of shelters in connection with the contemplated improvement works on Worth's Quay, for the City Council. Mr. Fredk. S. Barnes, A.M.I.C.E., city engineer and surveyor, Municipal Buildings, Truro.

WALES.—July 4.—For carrying out the following works, for the Barry Local Education Authority:—(1) Conversion of Barry Island manual instruction room into a domestic centre; (2) erection of a new manual instruction room and caretaker's house, Amherst Crescent, Barry Island; (3) plumbing work in connection with above. Deposit 1*l.* 1*s.* Mr. G. A. Birkenhead, architect, 102 St. Mary Street, Cardiff, and St. Nicholas Road, Barry.

WALES.—July 4.—For erection of fourteen houses at Pentwyn, Vochriw, for the Pentwyn Building Club. Mr. Treharne Jones, architect and surveyor, Nelson, *viâ* Cardiff.

WALES.—July 5.—For making additions and alterations to the Conservative Club, Penrhiwceiber. Mr. T. W. Millar, M.S.A., architect and surveyor, Mountain Ash.

WALES.—July 5.—For alterations and improvements to the Blackwood old Council school, Blackwood, Mon. Mr. John Bain, F.R.I.B.A., County Council Offices, Newport, and at the school.

WALES.—July 7.—For erection of a pair of cottage homes for children at Hirwain, for the Guardians of Merthyr Tydfil Union. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

WALES.—July 8.—For supply and erection of one wooden water-cooling tower, natural draught, with a capacity of 200,000 gallons per hour at Newport (Mon.). Deposit 3*l.* 3*s.* Mr. H. Collings Bishop, M.I.E.E., borough electrical engineer and tramways manager, Town Hall, Newport, Mon.

WALES.—July 9.—For the erection of Wesleyan Central Hall, Port Talbot. Deposit 1*l.* 1*s.* Messrs. Green, Knowles & Russell, architects, 19 South John Street, Liverpool.

WALES.—July 9.—For erection of a church-house at Bala, Merioneth. Rev. James Davies, Rectory, Bala.

WALES.—July 9.—For erection of four villas on Hillside Park, Gilfach, Bargoed. Mr. Idris Leyshon, architect and surveyor, 7 Hanbury Road, Bargoed.

WALES.—July 14.—For erection of a Council school building at Goodwick, Pembrokeshire. Deposit 1*l.* 1*s.* Captain Phillips, "Stop-and-Call," Goodwick, and also Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

WHISTON.—July 7.—For repairs and alterations at Cumber Lane Farm House and Buildings, Whiston, Prescot, Lancs. Deposit 10*s.* Mr. James Gandy, architect, Masonic buildings, St. Helen's.

WHITLEY BAY.—July 5.—For erection of a station at Whitley Bay, Northumberland, for the North-Eastern Railway Company. Mr. William Bell, the Company's architect, Central Station, Newcastle-on-Tyne.

WOKING.—July 5.—For erection of a new sorting office at Woking, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Postmaster, Woking, and H.M. Office of Works, Storey's Gate, London, S.W.

BRENTWOOD GRAMMAR SCHOOL.—The new buildings in connection with the Brentwood Grammar School were opened on Saturday, June 25, by Mrs. Heseltine, wife of the chairman of governors. The school, which was founded by Sir Anthony Browne in 1557, was a short time ago in danger of losing its individuality and becoming merged in the Essex County Council Schools. Mr. Edward North Buxton, chairman of the education committee, distributed the school prizes, and in the course of his remarks said "that it was a matter for congratulation that the school had succeeded in retaining its advantages, and that they (the education committee) who had to conform to rules would not be above taking hints from an independent body of governors whose hands were practically free in educational matters." The new buildings, with the land and sanatorium, gifts of Mr. Heseltine, cost in all over 9,000*l.* In every sense the buildings are fully equipped. The public spirit of Mr. Heseltine and other residents and old boys sees the promise of an ample reward in a modern home for a school whose purpose for over 300 years has been to advance virtue, learning, and manners. Messrs. Chancellor & Sons, of Chelmsford, are the architects.

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TENDERS.

BRENTFORD.

For extensions and additions to the Brentford town hall, Middlesex. Mr. H. T. WAKELAM, M.S.A., county architect, Guildhall, Westminster.

Wills	£2,723 0 0
Holloway	2,683 0 0
Patman & Fotheringham	2,593 0 0
Higgs & Hill	2,584 0 0
Dickens	2,570 0 0
Kearley	2,528 0 0
Mather	2,500 0 0
Fairhead & Son	2,464 0 0
Lawrence & Son	2,422 0 0
A. & B. Hanson	2,395 0 0
Bollom	2,392 0 0
Knight & Son	2,387 0 0
DOREY & Co., Brentford (*accepted*)	2,318 0 0
County architect's estimate	2,500 0 0

CHATTERIS

For steel water-storage tank, for the Urban District Council. Mr. SOLDEN HIPWELL, surveyor.

Dodman & Co.	£1,079 0 0
Head, Wrightson & Co.	910 0 0
Cockey & Co.	905 0 0
Whessoe Iron Foundry Co.	757 0 0
Frith, Blakeley, Sons & Co.	745 0 0
Heath	725 0 0
Barrett	713 0 0
CHATTERIS ENGINEERING WORKS Co., Chatteris (*accepted*)	700 0 0
Shanks	700 0 0
Dyson	585 0 0

DURHAM.

For the construction of new water mains from Sherburn to Shadforth, for the Durham Rural District Council. Mr. G. GREGSON, surveyor.

Griffiths & Co., London	£1,037 12 7
Carrick	801 14 9
SKINNER, Newcastle-on-Tyne (*accepted*)	739 1 9

GIRTON.

For rectory and grounds, Girton, near Cambridge, for the Rev. Robert M. Linton. Mr. G. WAYMOUTH, architect, 32-34 Theobald's Road, W.C.

Coulson & Lofts	£1.814 0 0
Chapman	1,752 14 6
Saint	1,596 0 0
Negus & Sons	1,565 0 0
Bell & Sons	1,532 0 0
WILLMOTT & SONS (*accepted conditionally*)	1,520 0 0

HARTFIELD.

For erecting a new classroom, &c., at the Voluntary schools. Mr. H. C. NIGHTINGALE, architect, East Grinstead.

Morris Bros.	£670 0 0
Roberts & Co.	627 0 0
C. & H. Gasson	575 0 0
Brooker Bros.	560 0 0
H. & E. Waters	487 0 0
WELLS, Crawley (*accepted*)	475 0 0

IRELAND.

For erecting business premises, Newtownards, for Messrs. George Walker & Co. Mr. THOMAS HOUSTON, architect, and civil engineer, Kingscourt, Wellington Place, Belfast.

Fraser	£895 0 0
Hogg & Sons	873 0 0
McDowell & Co.	867 0 0
Gordon & Son	800 0 0
Brown & Co.	794 15 6
Kirkpatrick	785 0 0
Paisley & Sons	781 0 0
SMITH, Newtownards (*accepted*)	751 0 0

LONDON.

For the erection of a new greenhouse at the Plaistow Recreation Ground, for the West Ham Borough Council.

Boulton & Paul	£260 0 0
Gray	246 10 0
Hayward & Co.	225 0 0
Weeks & Co.	205 8 0
MESSENGER & Co., Loughborough (*accepted*)	188 2 6
Wrinch & Sons	184 17 6

LONDON—*continued.*

For decorations and repairs to the church, chapel, and lodges at Lambeth Cemetery, Blackshaw Road, Tooting, S.W. Mr. H. EDWARDS, C.E., borough engineer.

Whitaker	£509 2 4
Harris	443 10 0
Casse	429 16 8
Dawson, Swainston & Co.	417 8 0
Sparks	393 18 0
Holland & Co.	390 0 0
Inns	342 0 0
F. & T. Johnson	338 10 0
Stevens	333 3 6
Wall	329 14 0
Lewis	310 0 0
Square	292 12 6
Lye & Sons	275 0 0
Lole & Co.	265 5 0
Dainton	256 0 0
ROGER, 114 Kennington Road, S.E. (*accepted*)	226 12 0
Webster & Son	224 0 0

For cleaning and painting works at London County Council Schools.

Monson Road, Deptford.

Appleby & Sons	£792 0 0
Leng	739 0 0
Bailey	692 0 0
Parker & Sons, Peckham (*recommended*)	567 0 0

Mantle Road, Deptford.

Holloway	866 0 0
Lowe & Co.,	785 0 0
Parker & Sons	697 0 0
Young	695 0 0
F. & G. Foster	681 10 0
Maxwell Bros.	649 0 0
Holliday & Greenwood	625 0 0
Akers & Co., South Norwood (*recommended*)	605 0 0

Halford Road, Fulham.

W. R. & A. Hide	933 5 0
Jewell	895 19 3
Roberts & Co.	841 0 0
Bendon	819 7 9
A. & F. Polden	738 5 0
Soole & Son	728 0 0
Carmichael	727 0 0
Lathey Bros.	698 0 0
Crook & Son	653 0 4
Lole & Co.	639 1 10
Triggs, Clapham (*recommended*)	615 0 0

Maidstone Street, Haggerston.

Grover & Son	714 0 0
Haydon & Sons	688 8 0
Roome & Co.	672 0 0
Price	659 0 0
Silk & Son	647 0 0
McCormick & Sons	642 0 0
Killby & Gayford	584 0 0
Munday & Sons	558 0 0
Symes (*recommended*)	539 0 0

Montem Street, Islington.

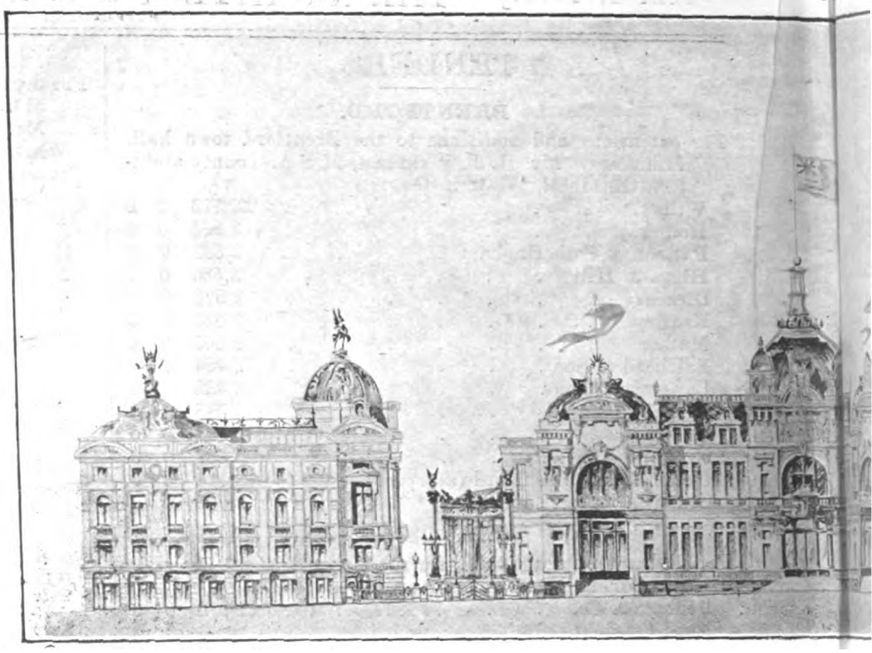
Brand, Pettit & Co.	1.416 0 0
Patman & Fotheringham	1.337 0 0
Marchant & Hirst	1.329 0 0
Roberts & Co.	1,289 0 0
Staines & Co.	1,235 0 0
Grover & Son	1,201 0 0
Stevens & Sons	1,186 0 0
Waddington & Son	1,160 0 0
Lawrance & Sons	1,113 0 0
McCormick & Sons, Islington (*recommended*)	1,098 0 0

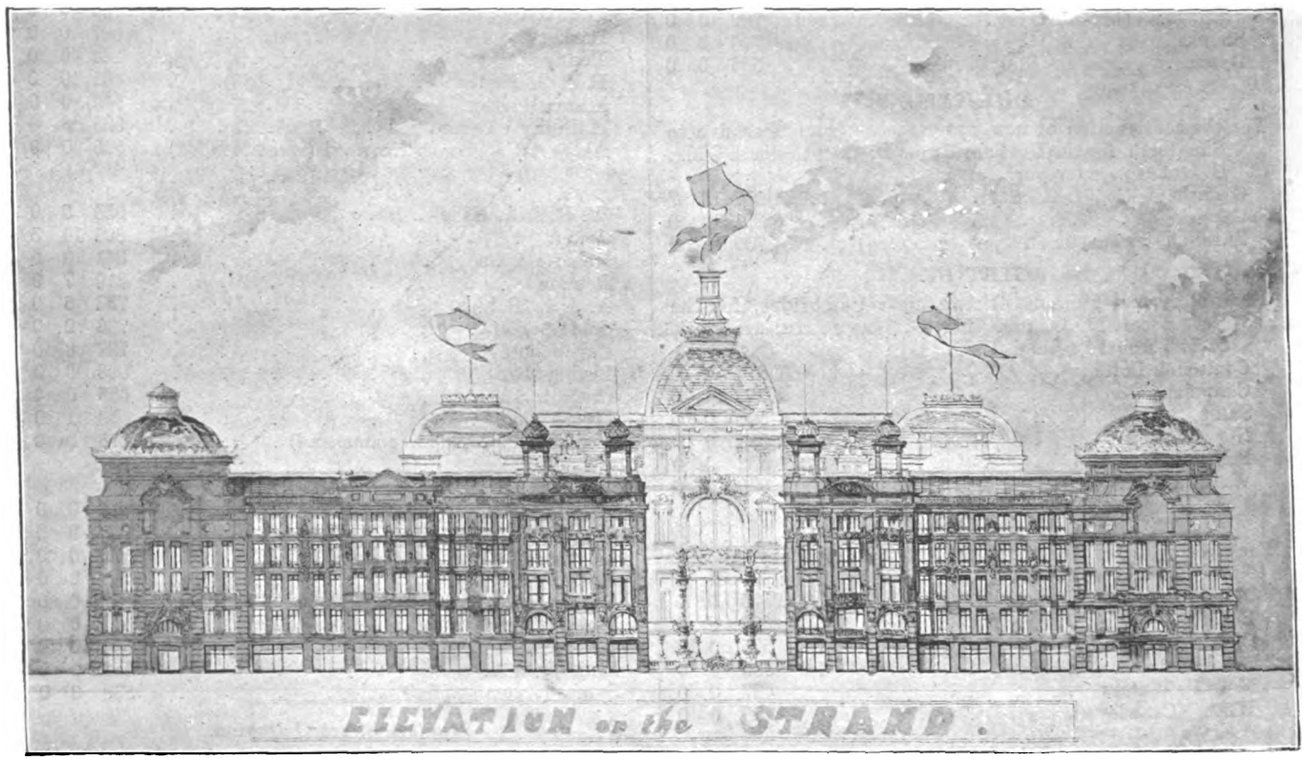
Rochelle Street, Bethnal Green.

Spencer, Santo & Co.	585 0 0
Markham & Markham	585 0 0
Press, Robinson & Co.	575 0 0
Williams & Son	560 0 0
Mather	560 0 0
F. & E. Davey	555 0 0
Killby & Gayford	550 0 0
Woollaston & Co., 40 Turner's Road (*recommended*)	540 0 0

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PALACE OF FRENCH INDUSTRIES.





ELEVATION TO STRAND.

PARIS IN LONDON.

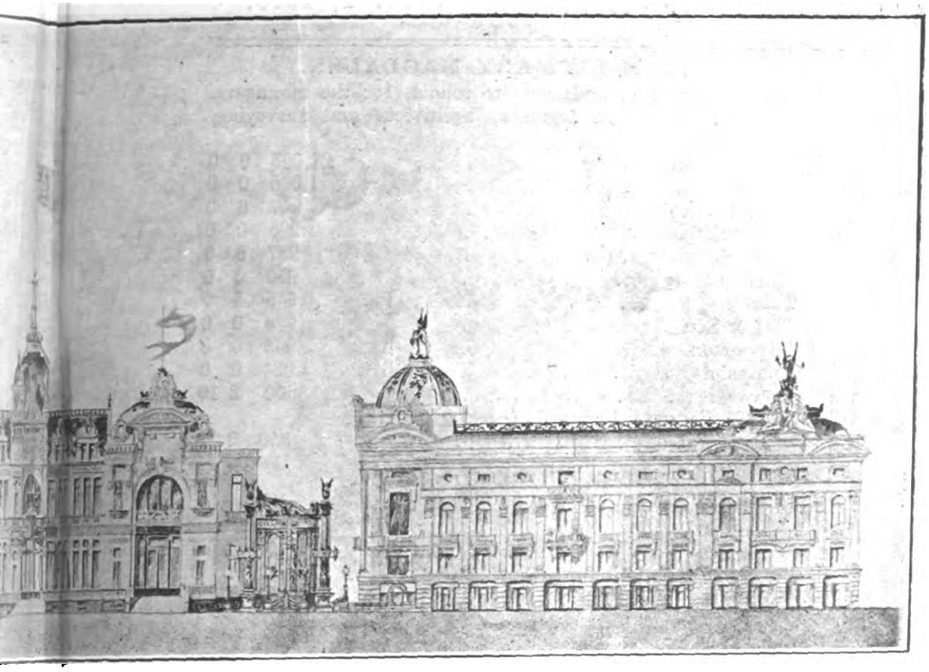
THE "Paris in London" scheme which the London County Council have sanctioned, and which will involve the conversion of the Aldwych site from a wilderness into a centre of recreation and business, appears to be now within reasonable prospect of realisation.

Paris will be represented—its boulevards, patisseries, restaurants, café chantants, and theatres, its modes and manners, and its arts and industries. It is probable that the actual building operations will be commenced in October, and it is expected that the work will take two and a-half years to complete. The syndicate who are engaged in the speculation are backed by well-known financiers and people of title, and about 750,000*l.* is to be spent on the undertaking.

The main building is to face the Kingsway with a rear entrance in the Strand, and is to be surrounded by two imposing blocks of shops and offices, like a segment of two concentric circles. The architect, Mr. Ernest Gerard, has designed the buildings in the style of the French Renaissance. The interior of the palace will be richly decorated with painted ceilings and marble pillars, and the roofs relieved here and there with domes and cupolas. The outer edge of this "Paris in London" will have fifty shops flanking the four sides of the island site, while on the inner edge of the encircling buildings there will be another fifty *magasins*. Some 800 suites of offices have been planned in the three storeys which will rise above the ground floor. All the shops will be taken by French and English firms, and many famous Paris firms are at present in negotiation for premises.

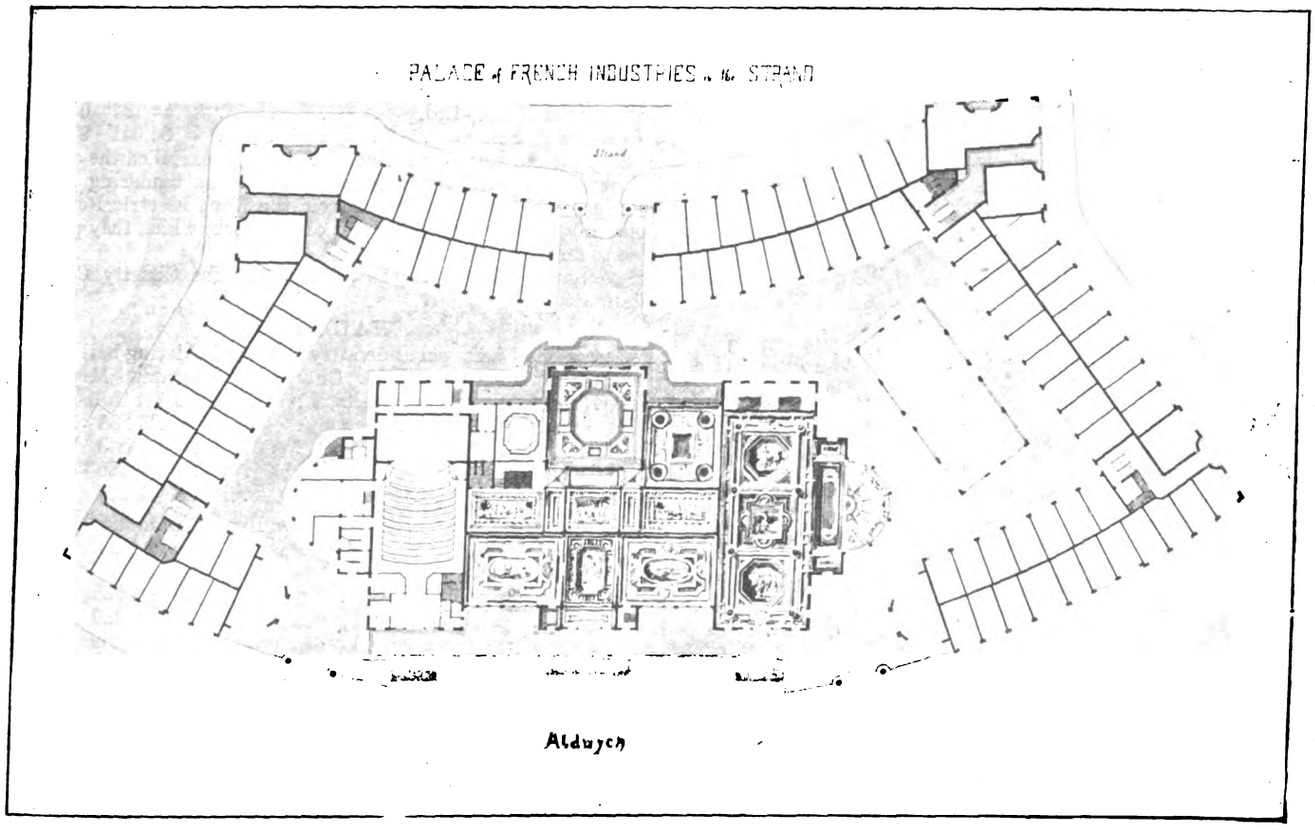
The chief feature, however, will not be the shops so much as the Palace of Industry, in the centre, which will be surrounded by courts, gardens, and shrubberies, with flower-beds and terraces, in the shadow of the outer buildings. In the

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UNIVERSITY OF CALIFORNIA

ELEVATION TO ALDWYCH



GROUND PLAN.

tympanum over the main porch of the palace in Aldwych there is to be a bas-relief as a permanent memorial of *l'entente cordiale*. King Edward VII. will be shown welcoming M. Loubet and his suite. In Aldwych the buildings will have a frontage of 450 feet. The Strand frontage will be 430 feet, and the depth of the buildings is to be 300 feet. The total area is 124,000 feet. The height of the buildings—from the pavement to the coping—will be 80 feet.

The palace will be divided into a grand hall, containing notable exhibits of French arts and industries; a restaurant, with grill-rooms, billiard-rooms, private dining-rooms, a café chantant, a winter garden, and a bijou theatre. Moreover, in the grounds there will be a patisserie, where French meals may be taken in *al fresco* fashion on the surrounding terrace. Near the patisserie will be a bandstand, in which French bands will play.

The bijou theatre will be devoted to the presentation of the best classical and modern French plays by the most capable actors and actresses that Paris can supply. It will be fitted with a Royal box, with ante-rooms attached, and there is to be a special Royal entrance near the Aldwych portals. The great hall will provide facilities for international receptions and industrial conferences.

In the main premises there is to be a French Club as a rendezvous for French business men and others visiting London, and it is hoped that it will become a centre for members of the French colony in England. The Anglo-French Syndicate, which has adopted the title of the French Palace Development Syndicate, Ltd., expects to be able to open the palace for the season of 1913. As the great aim of the syndicate is to give the people of London a true idea of Paris, the employees will be drawn from the French capital, and everything which can give the true Parisian touch to the scene will be secured.

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LONDON—*continued.*

Accepted tenders.

The address of the school follows the name of the successful tenderer.

Spencer, Santo & Co., Ltd., Hatfield Street, Southwark	468	0	0
Bailey, Sandford Row, Walworth	468	0	0
Press, Robinson & Co., Virginia Road, Bethnal Green	468	0	0
Bailey, Blackheath Road, Greenwich	460	0	0
Staines & Son, Prospect Terrace, St. Pancras	457	12	8
Triggs, The "Wandle," Wandsworth	433	0	0
Willmott, The Lawrence, Bethnal Green	415	0	0
Marchant & Hirst, Richard Street, Islington	405	0	0
Smith & Co., Bellenden Road, Dulwich	388	10	0
Fenn, The "Blackfriars," Southwark	378	18	0
Price, Eleanor Road, Hackney	377	0	0
Chappell, The "Acland" (H.E.), St. Pancras	375	0	0
Marchant & Hirst, New End, Hampstead	372	0	0
Willmott, Upton House Industrial School, Hackney	365	0	0
Read, King and Queen Street, Walworth	357	0	0
Marchant & Hirst, Popham Road, Islington	356	0	0
Williams & Son, The "Hugh Myddelton" (Junior), Finsbury	341	0	0
Turnbull & Son, Alexis Street, Bermondsey	341	0	0
Proctor & Sons, Weston Street, Bermondsey	335	0	0
Staines & Co., Ltd., Barrett Street, Marylebone	313	0	0
Garrett & Son, Cormont Road, Brixton	296	0	0
Vigor & Co., Upper North Street, Poplar	285	10	0
Orpin, The County Secondary School, Sydenham, Lewisham	237	0	0
Bull, The County Secondary School, South Hackney	235	0	0
King & Son, St. George's Row, St. George, Hanover Square	234	0	0
Young, The County Secondary School, Forest Hill, Lewisham	223	0	0
Vigor & Co., The "Millwall," Poplar	217	0	0

For the work of erecting eighty-two additional cottages on the third part of Section C of the Totterdown Fields Estate, Tooting, for the L.C.C.

Wallis & Sons	£19,114	0	0
Roberts & Co.	17,044	0	0
Wall	16,668	0	0
Gathercole Bros.	15,988	0	0
Rowley Bros., Tottenham (*recommended*)	15,918	0	0
Nicholls & Son, Finchley (*withdrawn*)	11,789	0	0

The architect's estimate, comparable with the tenders, is 17,200*l.*

For the provision of kitchen and scullery accommodation at the golfhouse at Hainault Forest in connection with the service of refreshments to the public, and also the provision for the accommodation of caddies.

Rowell & Co.	£199	0	0
Humphreys	187	0	0
Harbrow	175	0	0
McManus	160	0	0
Palmer & Co.	146	0	0
Hawkins & Co., 109 Victoria Street, S.W. (*recommended*)	129	0	0

For providing and fixing the necessary heating apparatus at the new central school on the Haverstock Hill site.

Stevens & Sons	£860	0	0
General Iron Foundry Co.	682	0	0
Korting Bros.	653	8	7
Fryer & Co.	629	10	0
J. & F. May	628	0	0
Strode & Co.	599	0	0
Cannon & Sons	590	0	0
Cannon & Hefford	589	0	0
Palowkar & Sons	578	0	0
Cash & Co.	578	0	0
Brightside Foundry and Engineering Co.	571	0	0
Purcell & Nobbs, Fitzroy Square (*recommended*)	513	0	0
Architect's estimate	610	0	0

For carrying out the necessary wiring and fittings for the electric lighting of Hammersmith Bridge, for the L.C.C.

Taylor & Co.	£328	0	0
Foote & Milne	256	0	0
Pinching & Walton, Cannon Street, E.C. (*recommended*)	239	19	6
Estimate of the chief engineer	200	0	0

PULHAM ST. MARY MAGDALEN.

For alterations and additions to school, for the managers. Messrs. LACEY & UPCHER, architects and surveyors, Norwich.

Wade & Son	£1,093	0	0
Riches	1,005	0	0
Scarles Bros.	997	0	0
Spencer, Santo & Co.	996	0	0
J. S. Smith	957	0	0
Morriss	950	0	0
Tofts	945	4	6
Gill & Son	944	0	0
Hipperson	944	0	0
Sampson	924	0	0
Dowe	900	2	10
E. J. SMITH, Bunwell (*accepted after modification*)	850	0	0

STRATFORD-ON-AVON.

For sewerage works at Wellesbourne, for the Rural District Council.

Wilmott	£3,978	0	0
WATSON, Cheltenham (*accepted*)	3,683	0	0
Byard & Sons	3,613	0	0
Bell & Sons	3,602	8	0
Smith & Co. (*amended*)	3,412	17	6

ROCHESTER.

For the partial reconstruction of Rochester Bridge for the Bridgewardens.

Pearson & Son, Ltd.	£91,942	0	0
Aird & Co.	88,736	3	4
Head, Wrightson & Co., Ltd.	78,000	0	0
*Arrol & Co., Ltd.	75,317	6	6
Hendyside & Co.	66,000	0	0
Westwood & Co., Ltd.	64,184	0	0
Cochran & Son	64,041	9	10

Some of the amounts included and others excluded the cost in connection with the wayleaves, the firms tendering not having succeeded in obtaining from the Kent Electric Power Company an estimate of the cost of the work, which they propose to do themselves.

* Accepted subject to the approval of the Charity Commissioners.

WALES.

For erection of a chapel and vestry on site of existing building of the Tabernacle C.M. Chapel, Penclawdd. Messrs. EVANS & JONES, architects, Llanelly and Port Talbot.

Bennett Bros.	£3,686	1	5
Jones	3,348	7	5
Radford & Greaves	3,286	0	0
DAVIES & SONS, Cardiff (*accepted*)	3,283	0	0

For erection of a Council school building at Lamphey, near Pembroke. Mr. D. E. THOMAS, architect, Haverfordwest.

Davies & Morgan	£2,525	0	0
Cole & Sons	2,520	0	0
DAVID, Pembroke Dock (*accepted*)	2,459	8	10

For alterations and additions to Beech Holme, Pwllycrochan Avenue, Colwyn Bay, together with new motor garage, &c. Mr. A. M. FOWLER, jun., architect, Llandrillo-yn-Rhos, North Wales.

General contract.

Davies	£2,198	2	5
Roberts	1,993	5	4
Davies & Sons	1,911	8	1
WOOD & Co., Colwyn Bay (*accepted*)	1,696	5	0

Plumber work.

Parry & Jones	305	17	1
JONES, Colwyn Bay (*accepted*)	256	17	0
Pierce & Co.	236	15	0

Steelwork.

E. Wood & Co.	172	10	0
S. Wood	97	15	0
LAMBOURNE & Co., Manchester (*accepted*)	91	10	0

Oak panelling, parquetry, &c.

Greenhalgh & Co.	249	0	0
Waring & Gillow	216	13	6
Goodall, Lamb & Heighway	215	15	0
ALLEN & SONS (*accepted*)	197	10	0

Conservatory.

Lowe & Sons	295	0	0
FOSTER & PEARSON, Beeston (*accepted*)	244	0	0

Heating apparatus.

SEEWARD & Co., Lancaster (*accepted*)	34	10	0

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THE "HEMPSTEAD FIREPROOF" DOORS TEST.

On Thursday of last week the Hempstead Patent Brick Co. held a test of two of their "fireproof" doors at the works in Redbourn Road, Hemel Hempstead, Herts. They were introduced into two parallel walls built close together across the kiln. One was a sliding door 7 feet by 4 feet 4 inches, constructed of wrought iron or steel tee frame filled in with patent hollow porous blocks 1½ inches thick, and coated with Keene's cement and sand found on the works, giving a total thickness of 2 inches. The frame and hanging part of the door were protected with an enclosing casing made of similar blocks, which prevent the expansion or warping of the runner bar or hangers, and at the same time offer an extra amount of fireproof partition. The test was carried out in a disused kiln. The fire was lighted at six o'clock A.M. By 10 A.M. the temperature, as recorded by the Roberts-Austen electrical pyrometer, was 2,000° Fahr. Shortly afterwards the protective casing collapsed, owing possibly to the shrinkage of the clay floor through the intense heat, leaving the edges of the door without protection. By 1.30 the door showed a crack across the top left corner and another across the middle, both of which had appeared subsequent to the collapse of the casing, together with one or two hair cracks. The temperature within a foot of the door on the outside was 105°. An hour afterwards the pyrometer gave a reading of 2,020°. Shortly afterwards the water at an 80-lb. pressure was played upon the door, with the result that cracks began to close, which process was continued when the fire was extinguished.

Separated from this sliding door by a 9-inch cavity was a hinged door 6 feet 6 inches by 2 feet 7 inches. This was subjected to precisely the same test, and with very much better results, for the surface of the door showed no cracks at all. The greatest damage occurred when the plaster came off in patches on water being applied. At about 3.30 the door was opened. Although it had been subjected to nine hours' severe test the door swung on its hinges without the least difficulty.

A few minutes later the sliding door was pushed back. The runner bar proved to have got slightly bent through the collapse of the casing; nevertheless the partition door was moved without any trouble. The accident may consequently be regarded as a fortunate one in so far as it showed in an unexpected way the independence of the door as to its casing.

The most detailed scrutiny of the two Hempstead "fireproof" doors only increased the good impression made on the gathering of experts who were invited to view the test.

TRADE NOTES.

AN interesting acquisition has been made to the Royal Doulton Pottery, Burslem, of the original pattern-books of the old and renowned Leeds factory. These show the original designs of ware in their colours as well as prices paid to the workmen. As Doulton's have recently made a speciality of reproducing designs of this celebrated factory, the old pattern-books are extremely valuable. They were found amongst some lumber at a recent sale of the effects of a wealthy Manchester connoisseur.

MESSRS. GEO. MILLS & CO., LTD., Radcliffe, near Manchester, have received the following letter from the Stanley Spinning Co., Ltd.:—"On April 12 we beg to inform you that a fire broke out in our mill, but it was promptly and most efficiently extinguished with the 'Titan' sprinkler you erected us some years ago. It affords us great pleasure to send a testimonial of this character,and we are also glad to say the alarms and everything in connection with the installation acted in a most satisfactory manner." A somewhat similar letter has reached them from the Albert Mills Co., Ltd., cotton spinners, Oldham. On May 13 a fire broke out in one of their mule headstocks and instantly travelled the greater portion of the mule. Fortunately, the "Titan" sprinkler heads erected a good many years ago promptly came into action and extinguished the fire most satisfactorily.

IT is interesting to learn that the living huts and observatory for Captain Scott's 1910 Antarctic Expedition, all of which were made by Messrs. Boulton & Paul, of Norwich, have been lined throughout—walls, floor, and roofs—with two layers of Cabot's Double Ply Quilt as a protection against the extreme temperatures. This is a fine feather in the cap of Arthur L. Gibson & Co., of Twickenham, by whom the Quilt was supplied. Most people know of Cabot's Quilt as a highly efficient sound deadener; but many overlook its qualities as an insulator against heat and cold. That these are equally excellent is shown not only by the selection of the material for use in the Antarctic Expedition, but also by the experience of an American who lined a thin wooden shanty or sun-house fitted with a glass front with the double-ply Quilt. The thermometers placed inside and outside showed a difference of from 60 to 100° Fahr., depending upon the amount of sunshine and the outside temperature. Several times the inside thermometer (which was so placed that the sun did not strike it) registered 100° and over, while the one outside stood at zero or lower. This difference was due wholly to the sun and insulation, as there was no artificial heat whatever in the shanty. Messrs. A. L. Gibson pertinently ask, If a lining of Quilt will make a difference of 100° in a hut built of one layer of boards and one of shingles, and warmed by the sun's rays alone, how much in fuel and how much in doctor's bills will be saved to the man who lines his house with it? It makes a room warm in winter and cool in summer.

NEW CATALOGUES.

A NEW material has lately been put upon the market under the name of "Deconverre," by Messrs Wotton & Sons, of Poplar Walk, Croydon. The invention is a glass decoration, by means of which the patentees are enabled to present the effects of leaded lights or stained glass windows. The process consists in laying raised lines of decoration on the surface of the glass, either on one or both sides, and the application of colour stains inside the pattern, the whole of the decorative work is then burnt into the surface of the glass and by this means becomes permanent and indestructible. Any architect's design can be faithfully carried out; the effect is excellent. By this process, while many of their disadvantages can be eliminated, all the effect of leaded lights can be produced. The firm have already several important contracts in hand, for Church work, banks, and refreshment houses, and there is no difficulty in predicting a prosperous future for the new material. Some imitations are good, some are bad, and others are worse. In this case, however, it is very easy to class this one of the latest imitations under the category of good. At the present time Messrs. Wotton have a small catalogue giving a few designs only; but, as explained, practically any design can be executed in "Deconverre."

MESSRS. AUSTIN & CO., elevator and lift manufacturers, Newcastle-on-Tyne, have placed at the end of their illustrated catalogue a list of some of the firms who have their elevators, lifts, and hoists in operation. It forcibly shows that they have built up a big business in the north, and more especially in their own town. The firm make all kinds of elevators, but particularly recommend their direct coupled electric elevators as being the most satisfactory and ultimately the most economical. All the safety and current-saving devices are employed in the construction of their passenger and goods lifts, whether worked by hydraulic, electric, or hand power. Their improved builders' friction hoist is so designed that it will start without jerking, and stop exactly where required at any part of the travel; furthermore, the load can be raised or lowered the very smallest distance at one time. The machine is self-contained, being built on a strong iron bed-plate.

MESSRS. RAGOSINE & CO., LTD., have issued a new price list of their paints and varnishes, which are sold under the mark of the "Roy Oak" brands. All the varnishes are made at their Barking works, of the best materials, and are well matured and tested before they are sent out. The list includes dry colours, colours ground in oil, colours ground in turps, patent preservatives and spirit varnishes and polishes.

THE RIVET, BOLT & NUT CO., LTD., Glasgow, make their excellently produced catalogue something in the way of a technical work of reference, for in addition to prices and illustrations it contains approximate weights of bolts, nuts, rivets, and bars; particulars of British standard and other tests; hints on heating rivets; standard dimensions, and other information, making it handy for every-day use by architects, engineers, &c.

MESSRS. J. H. HEATHMAN & CO., Parson's Green, Fulham, S.W., have sent us three loose sheets illustrating their designs for fire protectional appliances, ladders, steps, and trestles. The firm would appear to manufacture a different sort of ladder for every different sort of use. Their success has been for many years beyond all question, and their work is to be seen in the palace, the castle, the cathedral, and the villa.

J. & M. CRAIG (Kilmarnock), LTD., fireclay manufacturers, &c., are issuing a very compact pocket edition of their catalogue. The firm are the makers of "The Buchan Trap," which for forty years has been extending its sphere

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until now it must be known over four continents. We believe we are correct in saying that this trap was in the first place invented by Dr. John Honeyman, R.S.A., architect, half a century ago, and that it was taken up and developed by Mr. W. Buchan, a Glasgow plumber, after some years of neglect. It marks an important stage in sanitary science. There are other important Buchan patents made by the firm, as well as those by other specialists. Messrs. J. & M. Craig produce all kinds of sanitary fireclay ware, which are described, illustrated, and numbered in the catalogue.

VARIETIES.

A COMPANY is to be formed with a capital of about 154,000*l.* to build a large hotel at Calgary, N.W.T., Canada.

MR. JAMES MILLER, A.R.I.B.A., Sheffield, has been appointed by the Council as assistant in the architectural department of Sheffield University for one year.

THE Maldens and Coombe Council have accepted the scheme for widening the arches carrying the railway over Coombe Road near New Malden Station at an estimated cost of 6,350*l.*

A FATAL accident is reported at Sharavogue House, King's County, the Irish residence of the Earl of Huntingdon, by which two lives were lost, caused by an escape of acetylene gas coming in contact with a naked light.

PAISLEY Town Council have accepted the offer of Mr. John Watt, Glasgow, for the work in connection with the extension of the Rowbank reservoirs. The amount of the tender is 40,087*l.* 10*s.* 4*d.*

THE Rochester Bridge wardens, subject to the approval of the Charity Commissioners, have accepted the tender of Sir William Arrol & Co. for 75,317*l.*, for the rebuilding of Rochester bridge.

AT the annual meeting of the Lancashire, Cheshire, and North Wales Building Trades Employers' Federation in Manchester, Mr. F. Woods (Messrs. J. C. & F. Woods, Bolton) was elected president for the ensuing year.

AT the Manchester School of Technology, Sackville Street, a free exhibition of works in wood and woodcarving, as recently shown in Carpenters' Hall, London, was opened by Mr. John Brooke, F.R.I.B.A., on June 20. The exhibition will close to-morrow, the 2nd inst.

AN international competition will be organised for plans of a memorial to the Emperor Alexander II. which is to be set up in St. Petersburg at a cost of not more than 40,000*l.* The main feature of the monument is to be a bronze figure on a marble pedestal.

A COMPETITION is to be organised in connection with the provision of a church on the West Shore in the Parish of Llandudno. The competitors will be restricted to architects who have practised for not less than five years with full qualifications in North Wales or the city of Chester.

THE General Secretary of the National Federation of Building Trade Employers in South Africa gives notice that a limited number of stone masons (free-stone cutters) is required in the Transvaal, South Africa, on a two years' contract, at the standard rate of wages, 2*s.* 6*d.* per hour. Only industrious and skilful workmen would be accepted.

THE Imperial Trade correspondent at Winnipeg, informs the *Board of Trade Journal* that there is likely to be considerable activity in the Provinces of Alberta, Saskatchewan and Manitoba in the carrying out of municipal improvements this year. Activity in building operations is increasing in all the towns at the present time: the permits being taken out exceed in number those of any previous year.

BY the courtesy of the President and Council of the Society of Antiquaries of London, the ordinary monthly meetings of the Royal Archæological Institute will, until further notice, be held in the Society's apartments, Burlington House, Piccadilly, W., at 4.30 o'clock, on the first Wednesdays of the months of February, March, April, May, June, July, November and December.

THE Bishop of Aberdeen and Orkney has issued a circular letter to his diocese regarding a new proposal to erect a cathedral in the city of Aberdeen. He pointed out that there was no church in Aberdeen that could in its existing condition be raised to the status of a cathedral. There was, however, one church which occupied a commanding position in the city, and this church, if reconstructed and enlarged, might be made worthy to become the cathedral church of the diocese —viz. St. John's Church in Crown Terrace.

THE Board of Trade *Labour Gazette* report on Labour Exchanges during May shows that the total number on the register was 75,402 at the end of May, the corresponding number at the end of April being 81,523. Of the applications on the register, the largest percentages occur in the following groups of trades:—Conveyance of men, goods, and messages, 18.3; metals, machines, implements, and conveyances, 14.5; general labourers, 12.7; and building and works of construction, 11.0. Of the vacancies filled during May the largest percentage was yielded by the building and constructional works, viz., 16.4.

THE ruin of the Lyveden "New Build," situate at Brigstock, near Thrapston, Northamptonshire, erected about the year 1600 by Sir Thomas Tresham, of Rushton (father of Francis Tresham, one of the principal conspirators in the Gunpowder Plot), is offered for sale. The building is in the form of a Greek cross, and is adorned with emblems of the Crucifixion and inscribed with legends. Close by is the Lyveden "Old Build," or Manor House, containing a very fine balustraded oak staircase with moulded fireplaces and doorways, and in immediate proximity are remains of terraces and moats of an early period. The buildings are situate in delightful and secluded surroundings, and are fully described in the monograph on the "Buildings of Sir Thomas Tresham," by Mr. J. Alfred Gotch, F.S.A., F.R.I.B.A.

DURING July and August parties of German housing reformers will visit this country. The visits have been organised by the Garden Cities and Town-planning Association. Starting on July 4, the visitors will, under the guidance of Mr. Ewart G. Culpin, the secretary, go to York, Earswick, Liverpool, Port Sunlight, Birmingham, Harborne, and Bournville before returning to London. A week in London will be spent in visits to Letchworth Garden City, Hampstead Garden Suburb, Ealing, London County Council, and other housing experiments. A return visit to Germany is contemplated in September. The following towns will be included:—Essen, Düsseldorf, Cologne, Frankfort, Stuttgart, Ulm, and Nuremberg, and several industrial villages and communities on Garden City lines.

IN connection with the Brussels International Exhibition the Great Eastern Railway Company will run their steamers between Parkeston Quay, Harwich, and Antwerp daily, Sundays included, instead of every weekday, during July, August, and September. Passengers will be able to leave London (Liverpool Street Station) at 8.40 P.M. on Saturdays by the dining-car express train, arrive at Brussels at 10 the next morning, visit the Exhibition, and return the same night, being due to arrive at Liverpool Street Station, London, at 7.35 on Monday morning in time for business. Table d'hote breakfast will be served on the boat going up the Scheldt, and table d'hote dinner on the return journey soon after leaving Antwerp. Reduced return tickets are issued to Brussels every day, available for fourteen days.

"THE Early Days of the Sun Fire Office" is the title of a handsomely produced booklet of seventy odd pages, and illustrated by several interesting plates which reveal the germ from which, we might say, the whole business of modern insurance sprang. The originator of the Sun Fire Office was one Charles Povey, who in 1706 established at the Traders' Exchange House in Hatton Garden a fire office for insurance of "goods and merchandises in London and Westminster." In two years he decided to extend his operations all over Great Britain, being the first to venture beyond a ten mile radius of London. In March, 1710, Mr. Povey surrendered the undertaking to the Company of London Insurers, under its name of the Sun Fire Office, the business being divided into twenty-four shares among as many members, who were pledged to pay claims, share and share alike. The first policy was taken out by the proprietress of the Blackmoor's Head, Covent Garden, the amount for all the early policies being 500*l.*, at a premium of 10*s.* per annum. The earliest Sun mark now in the possession of the company belongs to Policy No. 838, dated January 13, 1711, insuring a house in Church Row, Fulham. In ten years the sum insured was no less than ten million pounds sterling, while the value of an original share which was 60*l.* in 1713, increased to 175*l.*, and then to 500*l.* in the two following years, whilst in 1720 they could not be had for 1,000 guineas. The Sun Fire Office commenced operations in one room in Paul's Coffee House at a rental of 15*l.* per annum. Changes continuously occurred until in 1838 the present site in Threadneedle Street was acquired; the plans for the new building were prepared by Professor Cockerell, R.A. The ceaseless expansion of business necessitated considerable additions and alterations in 1893, and these were carried out with as much regard as possible to the neo-Classic design. The booklet is valuable as well as interesting by reason of its plates, and the insight which its copious quotations afford into the business methods of two centuries ago. It makes an excellent souvenir of the bi-centenary of a great undertaking.

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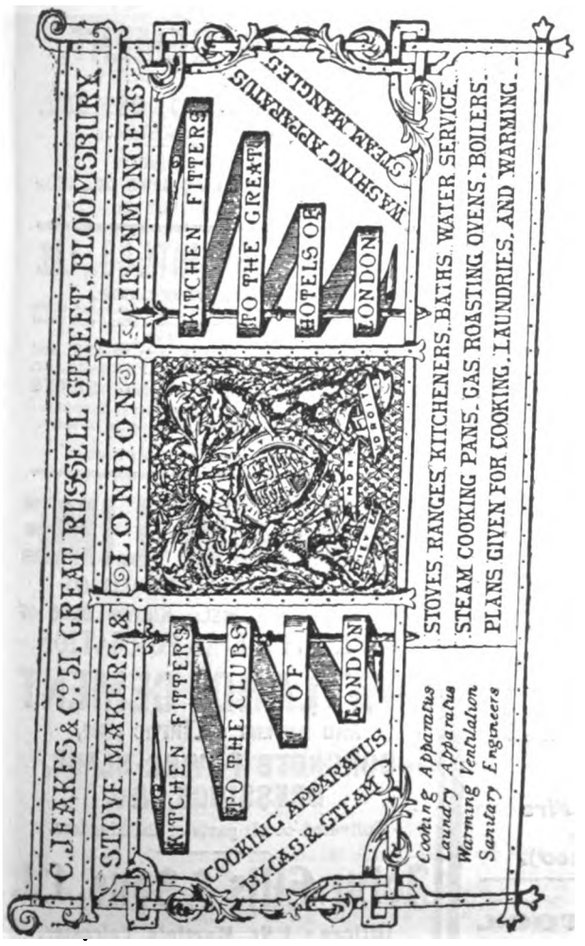
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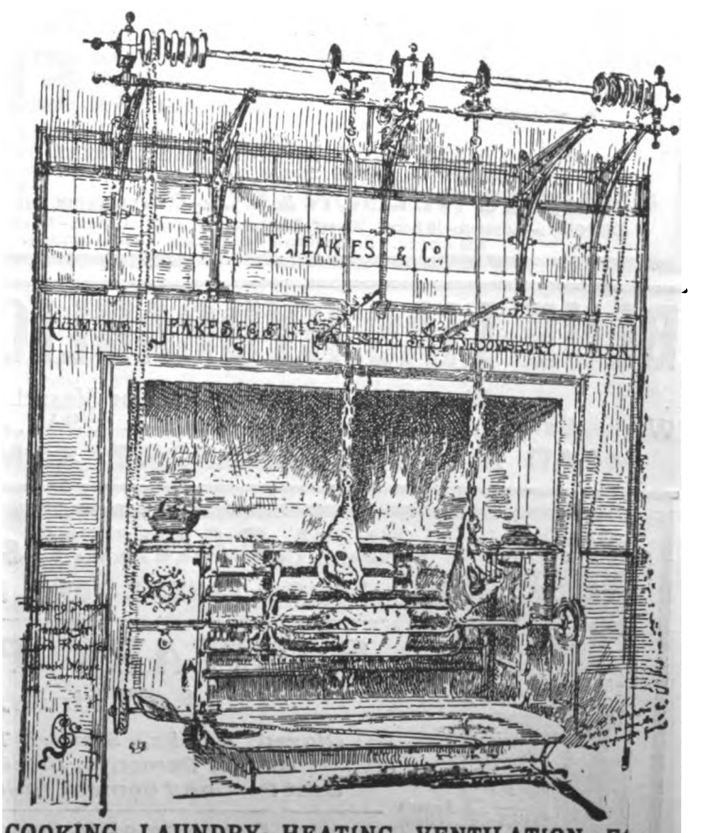
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EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

ASHTON-ON-MERSEY.—Architects practising within ten miles of Sale desirous of competing for proposed Sunday schools in connection with the Wesleyan Chapel are invited to communicate with Mr. J. O. Barrow, Barker's Lane, Ashton-on-Mersey.

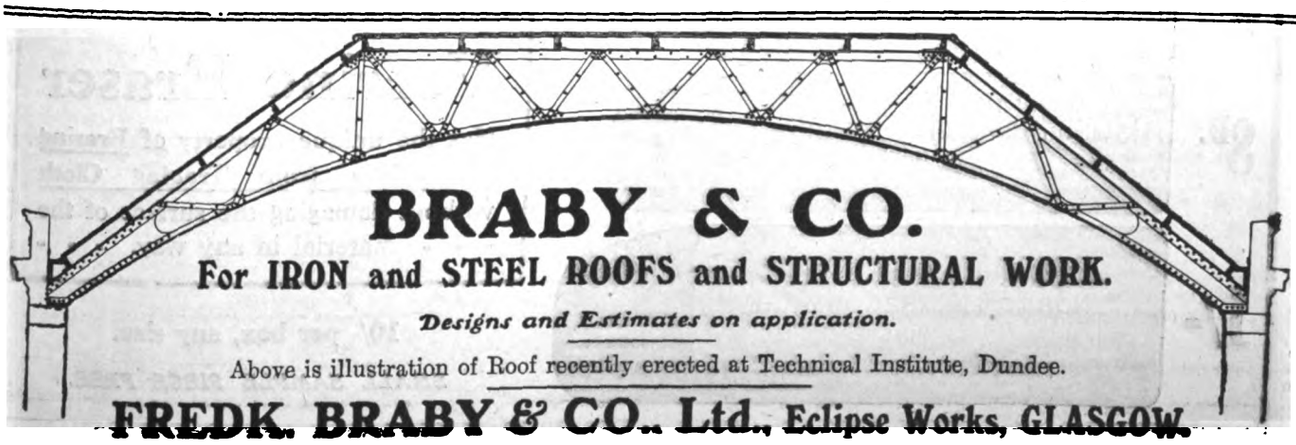
BELFAST.—Sept. 5.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

SCOTLAND.—The committee of Buckhaven Co-operative Society, Ltd., is prepared to receive competitive plans for proposed extension to bakery premises. Full particulars may be had from the Manager, Randolph Street, Buckhaven.

WINCHESTER.—July 25.—Architects practising in Hampshire. Designs for elementary school buildings to accommodate 330 children. Premiums of 50*l.*, 30*l.*, and 20*l.* Particulars from Mr. Thomas Holt, town clerk, Guildhall, Winchester.

THE Bournemouth Town Council, on the 1st inst., decided to carry out the extension of the Undercliff Drive as far as Boscombe, and provide sites for bathing stations and additional shelters on the East Cliff, the cost of the whole scheme being about 45,000*l.* The Corporation has been discussing the Undercliff Drive question for twenty years.



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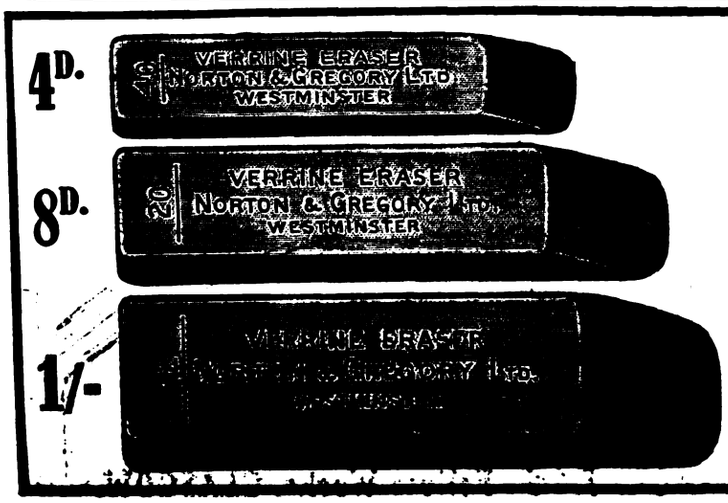
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ASPATRIA.—July 14.—For erection of two shops at Aspatria, Cumberland. Mr. Wilk. Serginson, architect, Prospect.

BARROW-IN-FURNESS.—July 11.—For the construction of two dormer windows in class-rooms at the Cambridge Street schools. The Borough Engineer and Surveyor's Office, Town Hall.

BECKENHAM.—July 11.—For annual repairs and decorations of the public elementary schools in the district. Deposit 10*s*. Mr. John A. Angell, surveyor, Beckenham.

BELFAST.—July 18.—For rebuilding Argyle Place Presbyterian church. Deposit 1*l*. 1*s*. Mr. A. Ferguson, Scottish Provident Buildings, Belfast.

BILLINGSHURST.—July 25.—For erection of a new infants' Council school and alterations and additions to the existing Council school at Billingshurst, West Sussex. Deposit 1*l*. 1*s*. Send names by July 10 to Mr. Haydn P. Roberts, A.R.I.B.A., county education architect, Horsham.

BLAYDON.—July 19.—For erection of a secondary school at Blaydon (sole tenders), Durham. Mr. W. Rushworth, county education architect, Shire Hall, Durham.

BRADFORD.—July 18.—For the following work at Bradford court-house, viz., alterations, &c. (builder, joiner, plasterer, plumber, painter). The West Riding Architect, County Hall, Wakefield. Send 1*l*. deposit to the West Riding Treasurer, County Hall, Wakefield.

BRAMPTON.—July 16.—For erection of five single cottages and ten sets of farm buildings, situate in Warboys Fen, Farcet Fen, Yaxley Fen, Ponder's Bridge, Ramsey, and Upwood Common Farm, near Ramsey Heights, for the small holdings and allotments committee of the Huntingdonshire County Council. Mr. S. Croot, land steward, Brampton, Hunts.

BRIGHTON.—July 13.—For certain alterations and additions to the Municipal School of Art, Grand Parade. Messrs. T. Simpson & Son, surveyors, 16 Ship Street, Brighton.

BRIGHTON.—July 13.—For internal and external repairs, painting, &c., to certain schools, to be carried out during the month of August; also for the installation of the electric light in the Park Street Council school. Messrs. T. Simpson & Son, surveyors to the committee, 16 Ship Street, Brighton.

BRISTOL.—July 19.—For reglazing, reslating, and repairing portions of the roof of the joint station at Bristol, for the Great Western and Midland Railways joint committee. The Engineer, Bristol Joint Station.

CASTLEFORD.—July 15.—For the erection of a sliding partition in the Cutsyke Council school, also for alterations and improvements to the heating apparatus Glass Houghton Council school, for the Whitwood education district sub-committee. Mr. B. Leah, Education Office, Castleford, Yorks.

CHESTERFIELD.—July 14.—For the enlargement of Chesterfield post office, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l*. 1*s*. The Postmaster, Chesterfield, or H.M. Office of Works, Storey's Gate, London, S.W.

CLIFFE.—July 16.—For the execution of summer repairs at the Cliffe Cooling Street Council school. Mr. F. Wright, hon. correspondent, West Court, Cliffe, Rochester, Kent.

CLIFFE.—July 25.—For erection of a Council school to accommodate eighty infants, at Cliffe, Kent. Deposit 1*l*. Send names by July 14 to Mr. Fras. W. Crook, secretary to the Kent education committee, Caxton House, Westminster, S.W.

CLITHEROE.—July 18.—For the various works necessary in erection of a "bothy" at Higher Standen. Mr. Edmund T. Welch, architect and surveyor, York Street, Clitheroe.

DARTFORD.—July 12.—For the execution of summer repairs at the Dartford Heath Street and West Hill Council schools, for the Kent education committee. The caretaker's house, 10 Heath Street, and West Hill, also at 8 Hythe Street, Dartford.

DEWSBURY.—July 14.—For all or any of the works required in the erection of Batley Carr Council school. Messrs. Holtom & Fox, architects, Corporation Street, Dewsbury.

DEVONPORT.—July 13.—For the erection of a shelter in Devonport Park. Mr. J. F. Burns, borough surveyor, 29 Ker Street, Devonport.

DODDINGTON.—July 16.—For the execution of summer repairs at the Doddington Council school, The School, Doddington, Kent.

DURHAM.—July 19.—The Durham County Council invite sole tenders for (1) Cassop new school and extensions at Horden Colliery, Mr. W. Rushworth, Shire Hall, Durham; (2) alterations at Fulwell Council school, Mr. F. E. Coates, Shire Hall, Durham; (3) removal of the iron school, accommodation about 500 scholars, from Shotton colliery, and re-erection of the same at Blackhall Rocks. Mr. F. E. Coates, Shire Hall, Durham.

ELLAND.—July 13.—For the mason, carpenter and joiner, plumber and glazier, plasterer and slater, painter, and electric engineer trades in erection of two semi-detached villas, Victoria Road. Mr. Henry Thompson, architect and surveyor, Central Chambers, Elland, Yorks.

EYNSFORD.—July 11.—For the execution of summer repairs at the Eynsford Crockenhill Council school. Mr. W. G. Burgess, correspondent, Station Road, Swanley Junction, Kent.

GLOUCESTER.—July 15.—For works of repair, painting, &c., at the following buildings, for the Gloucestershire education committee, viz., Bilson Council school, Cinderford; Double View Council school, Cinderford; St. White's Council school, Cinderford; Steam Mills Council school, near Cinderford; Ellwood Council school, near Coleford; Plump Hill Council school, near Mitcheldean; Parkend Council school; Pillowell Council school, near Whitecroft. Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

GLASGOW.—July 25.—For the erection of the concert hall at the Scottish Exhibition of National History, Art, and Industry, 1911. Deposit 3*l*. 3*s*. with the Secretary, 190 West George Street. Messrs. Walker & Ramsay, architects, 108 Douglas Street, Glasgow.

GLUSBURN.—July 15.—For the following work:—Glusburn Council school additions (builder, joiner, slater, plumber, plasterer, painter), for the West Riding education committee. The Education Architect, County Hall, Wakefield, or the Divisional Clerk, Skipton. Send 1*l*. deposit to the West Riding Treasurer, County Hall, Wakefield.

GREAT CHART.—July 11.—For the execution of summer repairs at the Great Chart Council school. Mr. J. M. Poncia, correspondent, 17 Bank Street, Ashford, Kent.

HALIFAX.—July 13.—For mason and excavator, carpenter and joiner, slater, plasterer, and concretor, and plumber and glazier work required in erection of a cookery kitchen at the British Schools, Great Albion Street, and also for painter's work required at Belle Vue reading room and caretaker's quarters. Deposit 1*l*. Mr. James Lord, M.I.C.E., borough engineer, Town Hall, Halifax.

HARROGATE.—July 15.—For the erection of a large school and boarding houses near Harrogate, for the Woodard Society, Northern Division. Send 10*l*. 10*s*. deposit to Mr. R. E. Pawsey, bursar and secretary, 8 Regent Street, Barnsley. Send names by July 15 to Mr. W. Gillbee Scott, architect, 25 Bedford Row, London.

HEIGHINGTON.—July 18.—For alterations at the Wesleyan chapel and schools. Messrs. Kitching & Lee, architects, Houndgate Chambers, Darlington.

IRELAND.—July 13.—For building a machine embroidery school at Ballydougan, Gilford, co. Down, for Messrs. C. Blane & Son. Deposit 1*l*. 1*s*. Mr. J. St. John Phillips, B.E., A.R.I.B.A., architect, 16 Donegall Square South, Belfast; or Messrs. C. Blane & Son, Gilford.

KIDDERMINSTER.—July 9.—For the erection of a High School for Girls. Deposit 2*l*. 2*s*. Send names by July 9 to the County Education Office, Worcester.

LEEDS.—July 14.—For any of the trades required in the erection of the Armley Park Special Council school. The Education Department (architect's section), Calverley Street, Leeds.

LEEDS.—July 14.—For erection of the East Leeds Special Council school. The Education Department (architect's section), Calverley Street, Leeds.

LONDON.—July 12.—For painting, cleansing, repairs, &c., of public buildings, for the West Ham Town Council. Deposit 1*l*. Mr. John G. Morley, borough engineer, Town Hall, West Ham.

LONDON.—July 13.—For the breaking up and removal of the existing Limmer asphalte floor of the wash-house in the laundry at the Constance Road workhouse, East Dulwich, and laying new Limmer or equally suitable asphalte, for the Guardians of St. Giles, Camberwell. The Guardians' Offices, 29 Peckham Road, S.E.

LONDON.—July 14.—The Commissioners of H.M. Works and Public Buildings invite constructional schemes and tenders based thereon for the erection in reinforced concrete of vaults and retaining wall for the Public Offices extension, Westminster, S.W. Any system or systems of construction

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may be adopted for the whole or part of the work. Deposit 2*l.* 2*s.* H.M. Office of Works, Storey's Gate, S.W.

LONDON.—July 15.—For strengthening the floor of the Council Chamber at the Islington Town Hall, Upper Street, by means of stanchions and rolled-steel joists. Deposit 1*l.* 1*s.* Mr. J. Patten Barber, borough engineer, Town Hall, Upper Street.

LONDON.—July 28.—For the construction of exit iron staircases and the necessary structural alterations in connection therewith at the St. George's Workhouse, Mint Street, Borough, S.E. Deposit 1*l.* 1*s.* Mr. A. J. Wade, architect, 104 Harvist Road, Brondesbury, N.W.

MANCHESTER.—July 13.—For the reconstruction of the public urinal in passage off High Street, City. The City Surveyor's Office, Town Hall, Manchester.

MOW COP.—July 14.—For repairing and beautifying St. Luke's church. The Parsonage, Mow Cop, Staffs.

PONTEFRACT.—July 12.—For the bricklayer, mason, carpenter and joiner, plumber and glazier, and shopfitter works in the conversion of Northumberland House into two shops, for the Pontefract Industrial Society, Ltd. Messrs. Garside & Pennington, architects and surveyors, Pontefract and Castleford.

REDRUTH.—July 12.—For erection of a new house at Laity Farm, in the parish of Redruth, for the small holdings committee of the Cornwall County Council. The County Land Agent, Public Rooms, Truro.

ROCHDALE.—July 13.—For erection of workshops and boundary fence at the workhouse, Dearnley. Mr. F. H. Shuttleworth, architect, Littleborough.

SCOTLAND.—July 14.—For the mason, carpenter, slater, plasterer, plumber, iron, and painter works of sausage factory, at Millbank, Berryden, Aberdeen, for the Northern Co-operative Company, Ltd. Messrs. Wilsons & Walker, architects, 181A Union Street, Aberdeen.

SCOTLAND.—July 15.—For the mason, joiner, plumber, and slater work required for taking down and rebuilding cottage at Baikie, in the parish of Airlie. Mr. D. Ross, road surveyor, Kirriemuir.

SEABROOK.—July 13.—For alterations to the single constables' quarters at the Seabrook police station, Kent. The Office of the County Architect, 86 Week Street, Maidstone.

SHIPTON BELLINGER.—July 20.—For the erection of a Council school for ninety-nine children, and teacher's house. Deposit 2*l.* 2*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

SOLIHULL, NEAR BIRMINGHAM.—July 11.—For alterations to laundry buildings, &c., at the workhouse, Solihull, for machinery, &c. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

SOUTHWAITE.—July 14.—For building a dwelling-house and outbuildings at Cross Hill, about half a mile from Southwaite Station (L. & N. W. Rly.). The County Surveyor's Office, The Courts, Carlisle.

TORQUAY.—July 19.—For erection of a laundry building at the Torbay Hospital. Deposit 1*l.* 1*s.* Messrs. Watson & Watson, architects, 36 Torwood Street, Torquay.

TROWBRIDGE.—July 11.—For work to be done in taking down and re-roofing a portion of the county offices, for the Wilts County Council. Mr. J. George Powell, county architect and surveyor, Trowbridge.

WALES.—For reslating and sundry repairs at St. Luke's church, Cwmbwrla, also extension to school room. Send names to Messrs. C. S. Thomas, Meager & Jones, architects, 15 Wind Street, Swansea.

WALES.—July 9.—For erection of 200 houses, roads, and sewers on the Cefnyfan Estate, Cymmer, Port Talbot, for the Cefnyfan Building Syndicate. Send names by July 9 to Messrs. T. E. Richards & Kaye, architects and surveyors, Pontypridd and Cardiff.

WALES.—July 12.—For erection of a parish hall, class room, &c., for the Gellygaer parish council, Glamorgan. Deposit 1*l.* 1*s.* Mr. W. H. Shute, architect and surveyor, Western Mail Chambers, Newport.

WALES.—July 13.—For flooring, colouring, and other works to the Council school at Moylgrove, Pembrokeshire. Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

WALES.—July 14.—For erection of schoolroom at Colbren. Mr. Howel L. Williams, Danyfer, Colbren, Neath.

WALES.—July 14.—For erection of a Council school building at Goodwick, Pembrokeshire. Deposit 1*l.* 1*s.* Captain Phillips, "Stop-and-Call." Goodwick, and also Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

WALES.—July 15.—For erection of two semi-detached houses at Lisvane, near Cardiff. Deposit 1*l.* 1*s.* Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

WALES.—July 15.—For erection and completion of Zoar Welsh Congregational chapel and school, Maesteg. Deposit 1*l.* 1*s.* Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

WALES.—July 16.—For the conversion of present premises into shop and house at Stone Street, Llandovery. Mr. Thomas Roderick, architect, Clifton Street, Aberdare; or Mr. D. Morgan, Grove House, Stone Street, Llandovery.

WALES.—July 16.—For provision of new floors to escape landings and staircase at Cardiff workhouse. Mr. Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff.

WALES.—July 21.—For erection of a new mixed and infants' school at Cwmaman, near Aberdare. Mr. N. G. Lewis, architect, Abertillery. Send 2*l.* 2*s.* deposit to Mr. J. Morris, director, Education Offices, Aberdare.

WALSALL.—July 18.—For executing alterations and additions to the Tramway depot, Bloxwich Road, Birchills. The Borough Surveyor, Room 23, Council House, Walsall.

TENDERS.

BORROWASH.

For alterations and additions at Washington Mills. Mr. FRED. S. ANTLITT, architect, Draycott.

Tyres & Yates	£7,925 0 0
Herbert & Sons	7,900 0 0
Lovett	7,890 0 0
Haskard, Rudkin & Beck	7,873 0 0
Barlow & Co.	7,784 0 0
Pillatt	7,766 0 0
Moule & Co.	7,732 0 0
Bowles & Sons	7,700 0 0
Bradshaw Brothers	7,673 0 0
Moss & Sons	7,600 0 0
Messom	7,600 0 0
Sharp	7,494 0 0
Kellett & Sons	7,485 0 0
Walker & Slater	7,250 0 0
Chapman	7,227 0 0
PERKS & SON, LTD., Long Eaton (*accepted*)	6,900 0 0
Fryer	6,888 0 0
Dickinson	6,752 0 0

BRISTOL.

For erection of St. John's Church, Fishponds. Mr. E. H. LINGEN BARKER, architect.

Trask & Sons	£5,604 0 0
Jones	5,200 0 0
Browning	5,081 0 0
Flint, Nash & Co.	5,034 0 0
Foster	4,930 0 0
Long & Sons	4,925 0 0
Wheeler Bros.	4,915 0 0
Walters & Sons	4,892 0 0
Humfreys & Sons	4,850 0 0
Downs & Sons	4,808 0 0
Roberts & Co.	4,691 0 0
Colborne	4,674 0 0
Stephens, Bastow & Co.	4,550 0 0
Read	4,516 0 0
Love	4,481 0 0
Hayes & Sons	4,464 0 0
Clark & Sons	4,303 0 0
Lovell	4,037 0 0

EXETER.

For new offices, playsheds, fuel store, and other work, at the Episcopal schools, Mount Dinham. Mr. J. JERMAN, F.R.I.B.A., architect, Exeter.

Coles	£676 0 0
Eveleigh	675 10 0
Sleeman	663 10 0
Triggs	660 0 0
Brealy	657 0 0
Herbert	649 0 0
Soper	630 1 8
Bunclark	625 0 0
Oliver & Sons	613 15 0
Hooper	613 0 0
Stephens & Smith	612 0 0
Baker	611 0 0
SETTER & SON, Exeter (*accepted*)	598 0 0

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EXBOURNE.

For the restoration of the south aisle of Exbourne church.

Ash & Sons	£217 0 0
Nicholls	183 0 0
Petherick	185 0 0
CARWITHEN, Plymouth (*accepted*)	141 10 0

LEYTON.

For the construction of underground conveniences in High Road, Leytonstone. Mr. WILLIAM DAWSON, M.I.C.E., surveyor.

Kirk & Randall	£1,866 0 0
Manders	1,756 9 10
F. & G. Foster	1,754 0 0
Russell	1,717 0 0
Fitch & Cox	1,699 0 0
Sherwood	1,654 10 0
Shurmur & Sons	1,647 0 0
Nightingale	1,635 0 0
F. & A. Willmott	1,580 0 0
COXHEAD, Leytonstone (*accepted*)	1,496 0 0

LONDON.

For the cleaning and redecoration of the infirmary, for the Bethnal Green Guardians.

Joselyn & Young	£9.264 0 0
Barnett & Power	5,951 0 0
Stapleton & Sons	4,360 0 0
King & Sons	3,847 0 0
Stokes	3,695 0 0
Killby & Gayford	3,600 0 0
Woollaston & Co.	3,588 0 0
Proctor & Sons	3,540 0 0
Nightingale	3,465 0 0
INNS (*accepted*)	3,098 0 0

For painting roofs of calf and hide market at the Metropolitan Cattle Market, for the Corporation.

Killby & Gayford, Ltd.	£575 0 0
Johnson & Co., Ltd.	564 0 0
Lidstone	525 0 0
Kirkaldy & Son, Ltd.	320 0 0
Beaumont & Son	297 0 0
Inns (*recommended*)	293 0 0

For painting the Monnow Road school (Bermondsey) during the summer holidays for the L.C.C.

Appleby & Sons	£875 0 0
F. & T. Thorne	860 0 0
Munday & Sons	855 10 0
Leng	818 0 0
Groves	799 0 0
Vigor & Co.	797 0 0
Kirk & Randall, Woolwich (*recommended*)	698 0 0

For the erection of a fence along the boundary of the L.C.C. Norbury estate between Norton Gardens and Bavant Road, and the Stanford estate.

Johnson & Co.	£299 0 0
Whitehead & Co.	270 0 0
Stenning & Son	269 0 0
Horton & Son	258 10 0
Wood & Co., Leatherhead (*recommended*)	250 0 0

For the provision and erection of four hydraulic penstocks, four sluice valves, &c., required in connection with the enlargement of the Abbey Mills pumping station for the L.C.C.

Clayton, Goodfellow & Co.	£3,725 0 0
Glenfield & Kennedy	2,625 0 0
Cochrane	2,549 0 0
Markham & Co.	2,439 3 3
Blakeborough & Sons, Brighouse (*recommended*)	2,205 0 0

For the reconstruction of the existing internal fittings and the supply and fixing of new internal fittings at the Central Library for the "Open Access" system, for the Hackney Borough Council.

Wake & Dean	£353 3 0
A. F. White	347 0 0
Silk & Son	345 10 0
Elliott's Moulding and Joinery Co.	345 8 0
Roberts Stores	290 0 6
Elliott & Sons	284 0 0
Hampton & Sons	266 0 6
Townsend	265 15 10
Rose & Sons	234 9 6
J. P. White	229 0 0
Reason Manufacturing Co., Brighton (*recommended*)	179 8 0

MAIDENHEAD.

For additions to the County High School for Girls.

Newberry	£3,362 0 0
Drowley & Co.	3,360 0 0
Godwin & Co.	3,303 15 4
Bissley	3,251 19 0
Aldridge	3,217 13 0
Seward	3,136 0 0
Cox & Sons	3,133 0 0
Bosher & Sons	3,098 3 3
Crosby & Co.	3,059 0 10
Paul	3,032 0 0
Hunt & Son	2,872 0 0
Flint, Nash & Co.	2,854 0 0
Sutton	2,849 0 0
Hughes, Wokingham (*recommended*)	2,806 0 0
Patrick	2,787 0 0
Theaker	2,580 0 0

PORTSMOUTH.

For building a residence, chapel, boundary walls and gates in the new cemetery at Milton. The Borough Engineer.

Tanner	£8,122 0 0
Salter	7,715 0 0
Corke	7,687 0 0
Wakeham Bros.	7,601 0 0
Privett	7,399 0 0
Croad	7,321 0 0
Crockerell (*recommended*)	7,149 0 0

SCOTLAND.

For various works in connection with the erection of pavilion on the Low Green, for the Ayr Town Council.

Accepted tenders.

Clark, wright	£2,273 2 3
Paton & Sons, brickwork	1,723 3 6
R. & J. Jamie, slater and plumber	496 11 6
Fleming Bros., steel	432 16 6
Meillar, plasterer	386 6 9
Mackenzie & Moncur, heating and ventilating	234 14 2
M'Gilvray & M'Culloch, painter	117 7 1

TORQUAY.

For erection of a pavilion in the Princess Gardens. Mr. H. A. GARRETT, A.M.I.C.E., borough surveyor.

Blake & Son	£20,700 0 0
Watson & Son	20,397 2 8
Dallow & Sons	19,875 0 0
Pattinson & Son	19,488 0 0
Wakeham Bros.	19,397 11 4
Pollard & Co.	19,261 11 9
Bovey & Sons	17,945 0 0
Yeo & Sons	17,802 19 5
Narracott, Torquay (*recommended*)	16,942 4 4

UXBRIDGE.

For the construction of an underground pumping chamber, the laying of about 1,093 lineal yards of cast-iron rising main and appurtenant works at Vine Lane, Hillingdon East. Mr. JOHN WILLIAM HARRISON, engineer.

Chessum & Sons	£1,253 0 0
Watson	958 11 9
Garrett & Son	773 0 0
Stone	767 3 2
Atkinson & Co.	703 0 0
Aston	693 0 0
JOHNSON & STUNT, Yiewsley (*accepted*)	653 7 4
Perton & Co.	634 18 6

WALES.

For erection of thirty-three cottages at Cwmcelyn, Blaina, for the Central Building Club.

Tudor	£8,075 10 0
Gay & Head	7,922 4 0
T. W. & J. JENKINS, Merthyr Tydfil (*accepted*)	7,524 0 0

For erecting a Council school at Pengarnisiog, Ty Croes, Anglesey. Mr. JAMES OWEN, F.R.I.B.A., county architect, Menai Bridge.

Williams & Sons	£2,300 0 0
H. & I. Williams	2,300 0 0
Hughes & Son	2,299 10 0
Jones	2,210 0 0
J. Thomas	2,185 0 0
O. W. & T. Rowlands	1,755 0 0
R. THOMAS, Llanerchymedd (*accepted*)	1,646 0 0
Architect's estimate	1,987 0 0

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VARIETIES.

MR. H. F. WILLARD, architect, Tunbridge Wells, died suddenly last week while out walking with a friend.

THE county education authority have decided to erect a new elementary school at Llandrindod Wells.

THE ancient astronomical clock in Exeter Cathedral, which has recently been restored, was formally restarted by the Mayor at a special service.

THE Dartford Urban Council have approved of a scheme for providing a public hall capable of seating 1,000 persons. The estimate is over 5,000*l.*

MESSRS. MORTON & SONS, architects, South Shields, have been instructed by the York Board of Guardians to prepare plans for alterations at the Workhouse.

THE Liverpool Housing Committee have granted the request of the Liverpool Master Builders' Association, that the committee should receive a deputation to discuss the question of having an independent arbitrator in Corporation contracts.

AN elementary school and mentally defective centre is shortly to be erected at Romford according to the designs of Mr. A. S. R. Ley, architect, 54 and 55 Bishopsgate Street Without.

MR. E. APPLETON, F.R.I.B.A., has been instructed by the Torquay education committee to prepare plans for a proposed Provided school, on the Homelands site, to accommodate 300 children.

LEITH Co-operative Society, Ltd., have been granted warrant to erect five blocks of shops and dwelling houses, each four storeys in height, facing Great Junction Street, and the new street to be formed on ground lately occupied by the poorhouse.

AYR Dean of Guild Court have passed plans for the erection by Mr. G. S. Abbot, Braemar, Ayr, on behalf of the South Ayrshire Liberal Club, of club premises, shops, and workrooms in Sandgate and Boswell Park, Ayr, at an estimated cost of 4,000*l.*

OSWESTRY Town Council, on Monday, had to decide whether the streets should be lighted with gas or electricity during the next seven years. The General Purposes Committee recommended that gas be used, and after a warm discussion this was agreed to.

THE Berks County Council having applied to the Local Government Board for consent to the borrowing of a sum not exceeding 60,000*l.* for the reconstruction of certain main roads in the county, the Local Government Board have directed an inquiry to be held on July 14 by Mr. E. A. Sandford Fawcett, M.Inst.C.E.

THE Liverpool Garden Suburb Tenants, Ltd., who are associated with the Co-Partnership Tenants, Ltd., have secured an option to lease for 999 years about 185 acres of pasture land at Childwall. The board invites applications for 5,000 shares of 10*l.*, and for a 4 per cent. loan stock to the amount of 100,000*l.*, making a total capital of 150,000*l.*

THE reconstruction of the eastern portion of the Guildhall porch has now been completed as to its exterior, under the superintendence of Mr. Sydney Perks, F.S.A., F.R.I.B.A., the city surveyor, and the scaffolding was removed last Saturday. The front as at present is in accordance with the porch built by Dance in 1789.

THE Birmingham City Council on Tuesday gave authority to proceed with the erection and equipment of the proposed new fire station in Moseley Road at an estimated cost of 12,139*l.* This will complete the committee's scheme of fire protection for the city. The tender of Messrs. John Dallow & Sons, for 10,789*l.* has been accepted.

THE West Riding education committee have agreed that new elementary schools and additions to existing schools be provided as follows:—Adwick-upon-Dearne, 4,200*l.*; Cudworth, 3,000*l.*; Edlington, 12,000*l.*; Bolton-on-Dearne, Goldthorpe, 350*l.*; Bolton-on-Dearne, Highgate, 4,500*l.*; Brierley, Grimethorpe, 1,000*l.*; Knaresborough, 4,200*l.*; Thorne, Medge Hall, 200*l.*; Thorne, Moorends, 250*l.*; Thurnscoe, 400*l.*

THE Lord Mayor of London presided as Master at the last meeting of the Plumbers' Company at the Mansion House. A resolution as under was passed:—"That the Court heartily approves and pledges itself to support the action taken by the Master, the Lord Mayor, in advocating and encouraging the adoption of the principle of apprenticeship as the best practical means of securing for the rising generation adequate instruction in craftsmanship combined with continuity of training and experience."

PLANS of a new hospital for Wishaw were passed at the Burgh Dean of Guild Court on Monday. They show buildings of a composite kind consisting of four pavilions—scarlet fever, enteric fever, diphtheria, and convalescent wards—having provision for the treatment of about fifty patients. There is also an administrative block with accommodation for a large staff. The Local Government Board have approved of the plans. The hospital is estimated to cost upwards of 12,000*l.*

THE Local Government Board have had under consideration the report made by their Inspector, Mr. Hetherington, after his inquiry with reference to the application of the Rural District Council of Windsor for sanction to borrow 53,000*l.* for purposes of sewerage and sewage disposal for the parishes of Sunningdale and Sunninghill. The Board are advised that apart from any other consideration, the site proposed for the outfall works is unsuitable, inasmuch as it is undesirably near to dwelling houses, and the Board are unable therefore to accept a scheme which involves the use of this site. The Board are also advised that the proposed pumping arrangements are unsatisfactory, involving as they do the use of so many ejector stations and the generation of the necessary power so far from its point of application. The proposals of the District Council will have accordingly to be reconsidered.

A NEW Masters' Association has been formed of the heating, ventilating and domestic engineers of Sheffield and district. The inaugural meeting was held at the Builders' Exchange, Cross Burgess Street, and was preceded by a dinner. Mr. R. P. Fisher (Newton, Chambers, Ltd.) was elected president; Mr. Frank Biggin, of Sheffield (Brightside Foundry and Engineering Company, Ltd.), was elected vice-president and hon. secretary *pro tem.*; together with Messrs. Thomas Wright, Hedley S. Moorwood and G. F. Wells as the executive council. Among the others present were Messrs. William Truswell, Charles Pierce, Alfred E. Grindrod, B. Holroyd (Messrs. Braithwaite & Co.), and J. W. Ellis. The objects of the Association are to promote and further the interests of the members in the district, and protect and defend those interests against any action, conduct or proceeding which tends to impose unduly restrictive conditions upon any branch of the heating, ventilating and domestic engineers' trades. Further, to endeavour to settle differences which might arise among members.

THE London and South Western Railway will commence on July 26 to run a new daylight service from Southampton to Havre. A special boat train is to leave Waterloo at 8.55 a.m. on Tuesdays, Thursdays, and Saturdays, until September 17, in connection with the s.s. *Lydia*, which will cast off from Southampton at 11.15 a.m. This will be in addition to the usual week-night service, and is expected to become extremely popular. The Channel along the line of route is "densely populated," and offers the daylight traveller an ever-changing and fascinating scene, which should prove most attractive. Havre is the second port of France, and the best holiday centre for reaching the principal resorts in this picturesque region, including Etretat, Trouville, Caen, Cabourg, Houlgate, and Rouen. There is a convenient steamer service from Havre to Rouen through the lovely Seine Valley, or the visitor can travel by connecting train from Havre to Rouen and Paris. The return daylight service from Havre is on Wednesdays and Fridays; the steamer leaves at 11.30 a.m. and there are trains from Paris (St. Lazare), Rouen and Etretat in connection. Guides giving particulars of the resorts and places of interest, together with information as to hotels, apartments, &c., can be obtained free at the Company's various offices, or to Mr. Henry Holmes, Superintendent of the Line, Waterloo Station, S.E.

TRADE NOTES.

THE extensions to the isolation hospital, Enfield, are being supplied with Shorland's double-fronted patent Manchester stoves with descending smoke flues, patent Manchester grates, exhaust roof and special inlet ventilators, by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

MESSRS. WM. POTTS & SONS, LTD., clock manufacturers, Leeds and Newcastle, are now erecting the memorial hour striking clock to the Venerable Archdeacon Blunt, at the parish church, Arthington, near Leeds. Also thoroughly restoring for the Rotherham Corporation the parish church clock and chimes, and the Catterick parish church clock and chimes, Richmond, Yorkshire.

THE Sussex Portland Cement Co., Ltd., Newhaven, have issued a hanging wall calendar for the twelve months ending June 30, 1911. It is of a good design, and shows as a headpiece the interior of the central portion of Canterbury Cathedral, with the great tower. The view is appropriate because the company's "Newhaven" brand of Portland cement was used in the restoration of this historic structure.

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A CONVENIENT BOILER.

THE "Peerless" kitchen boiler may be described as a combined hot-water cylinder and geyser, because it answers all the purposes of the domestic hot-water cylinder and is connected in the usual way, while when occasion demands the water may be heated by gas instead of from the kitchen range. It frequently happens, most especially in the summer, that the heat from a range is insufficient for the supply at all times of the day of hot water of a desired temperature or in sufficient quantities. When such occasions arise the household that has a "Peerless" is a fortunate one, for by utilising the gas the water, after being quickly raised to the desired heat, may be drawn off anywhere. As our illustration indicates, the burner is underneath a disc or water-spreader placed below the boiler. The cold water is introduced from the top by the left-hand pipe, which is carried down to nearly the bottom of the boiler. It flows round the bottom until it passes down the small pipe on the right and up through the burner into the disc, where, after being heated, it passes up the pipe in the centre and so through all the hot-water supply. Thus it is in itself a circulating boiler. The combustion of the gas is ensured by an air-mixing chamber which is approximately regulated by the local agent before sale so as to ensure a blue flame. An important feature is the pilot light, which if kept continuously burning will keep the water at a constant heat if it is only drawn off gradually, or will gradually raise it if the water is not used. The consumption by this pilot light varies, of course, according to the pressure of gas, but it should rarely be more than 10 feet per hour. The makers have proved that the most economical method of using the "Peerless" heater is to light the large burner for between twenty and thirty minutes in the morning, and then to use only the pilot light for the remainder of the day. With gas at 3*s.* per 1,000 feet the cost for a ten-hour day would be about 2½*d.* In a recent test 30 gallons of water were raised 80° on a consumption of 54 feet of gas, and this quantity of water was maintained at a temperature of 140° on a consumption of 7 feet of gas per hour. The "Peerless" Heater Company's boilers are well known in America; until the company which is to be formed for their manufacture and sale in this country is in working order they will be imported from the United States. A 30-gallon boiler is, however, to be seen at the showrooms of Messrs. Davis, Bennett & Co., Horseferry Road, Westminster, S.W.



MANCHESTER SOCIETY OF ARCHITECTS.

ON Saturday, July 2, the third Saturday visit of the summer session took place to Shrewsbury, under the leadership of Mr. H. B. Laycock. In a single day one can do little more than glance at the multitude of interesting buildings in Shrewsbury. If one is to pay anything but passing attention to the wealth of Georgian work, one must leave the churches for another day (unless one is content with mere jottings) or the splendid Norman and later work at Holy Cross Abbey and St. Mary's Church will absorb all the time. The Georgian houses in Belmont were very much admired, and there were besides many fine half-timber houses of earlier date, of which the New Ship inn is a delightful example, which found places in the members' sketchbooks.

On the preceding Tuesday evening a large party of members visited Mr. Temple Moore's recently built church of St. Anne, at Royton, near Oldham. The vicar, the Rev. J. T. Ormerod, met the party and courteously conducted them over the building. The design is a very striking one. A timber barrel roof runs right through the nave and chancel, over an arcade of four great arches with wide soffites and square arrises, and a narrower transept arch on each side. Passage aisles are cut through the piers supporting the arcade, and the outer aisle walls contain traceried windows, there being no clerestory. By the extremely clever planning and lighting at the east end a delightful effect of mystery is obtained, the arcade and windows of the Lady chapel and processional aisles being seen over the altar and through an arcade of three arches across the east end of the chancel.

THE POTTERY INDUSTRY.

A REPORT has been issued by the Departmental Committee appointed to inquire into the dangers attendant on the use of lead in the various branches of the manufacture of china and earthenware, and in the processes incidental thereto. The Committee were appointed by the Home Secretary in 1908, and was asked to report how far such dangers can be obviated or lessened by improved appliances and methods in the lead processes, or by conducting any of those processes in separate rooms, or by limitation of the use of lead, or by substitution of harmless lead compounds for raw lead, or by substitution of other materials for lead, or by controlling the employment of susceptible persons in lead processes, or by precautions for detection of lead poisoning in the earlier stages. They were also to consider whether the danger or injury to health arising from dust or other causes in these manufactures can be further obviated or lessened.

The Committee visited as a body twenty-six potteries representative of the different branches of the trade. Of these fourteen were situated in the North of Staffordshire group of pottery towns, three at Newcastle-on-Tyne, eight in Glasgow and the neighbourhood, and one at Bristol. The Committee met on twenty-five occasions for the purpose of taking evidence, and seventy-one witnesses were examined, including medical men, practical chemists, operatives, representatives of Government Departments, and manufacturers.

In addition to the general provisions applicable to all factories under the Factory Act, 1901, the Home Office have on four separate occasions—viz. in 1894, 1898, 1901, and 1903—issued special rules, under the Factory Act of 1891, for the regulation of those potteries in which the operations are of a dangerous nature. The number of potteries, according to the Home Office returns of January 1, 1908, subject to these codes is 550. These 550 factories provide employment for some 63,000 workers, of whom nearly 48,000 are employed in North Staffordshire, and the remaining 15,000 in other parts of the country. These 63,000 workers may be classified as follows:—Workers in dangerous processes involving contact with lead, 6,865; workers incurring danger from breathing dust other than that of lead, about 23,000; workers not engaged in dangerous processes, about 33,000. Those engaged in processes in which the chief danger is lead poisoning amount only to about 11 per cent. of the total amount employed in the industry. A much larger proportion, about 36 per cent., are liable to inhale the dusts of clay, flint, or other materials used in the manufacture of the ware.

The Committee gave much of their time to considering the dangers attendant on the use of lead in the manufacture of pottery, and many witnesses were examined as to the feasibility of prohibiting it. In their preliminary remarks the Committee state that lead poisoning is largely to be accounted for by defective conditions of labour, especially when not associated with adequate exhaust draughts. Such conditions necessarily vary in different potteries, but it appears probable to the Committee that undue pressure of work is also an important factor in producing an outbreak of the disease. They express regret that the rate of improvement, which was considerable between 1897 and 1901, was not maintained during the years 1902-8. The annual number of cases during that period remained far below those of 1900 and the preceding years, but showed no tendency to further diminution until 1909, when there was again a considerable drop. The Committee consider that the fact that the number of cases was not reduced between 1902 and 1908 is all the more disappointing in view of the successive introduction in 1901 and 1903 of still more stringent conditions. It was suggested to the Committee that this apparent lack of progress might be due, at least in part, to the introduction of the system of granting compensation to all suffering from lead poisoning contracted in potteries. No opinion is expressed as to this, but the Committee think that, judging from the potteries visited by them, lead poisoning is chiefly attributable to the imperfections in the conditions under which the workers labour and to the very casual observance which in some is paid, both by employers and employed, to many of the special rules in force.

The Committee are of opinion that the illnesses resulting from dusts and the conditions of work connected with them are very serious, and far more widespread than lead poisoning, and point out that it is at least as important to collect statistics of the numbers liable to breathe silicious, clay, or other dusts, as of the lead workers. The number of workers affected by this general dust is estimated to amount to some 23,000. If the leadworkers are added to these figures, it appears that nearly one-half of the operatives employed in

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the manufacture of earthenware and china are liable to inhale noxious dust of one kind or another.

Of the 6,865 workers engaged in lead processes, 927 are employed in the manufacture of china, 3,946 earthenware, 961 tiles, 266 majolica, 241 jet and rockingham, 245 china furniture and electrical fittings and 279 sanitary ware; ordinary earthenware and china bodies are porous, and require to be coated with an impervious layer known as a glaze, in the making of which for centuries past compounds of lead have been widely used. Evidence has been put forward that a very good glaze can be procured apart from lead, and that such leadless glazes are quite efficacious and suitable, though some of them are stated to render the finished article more costly to produce. On the other hand, it is affirmed that a lead glaze has distinct advantages; the covering which it gives, whether to earthenware or china "bodies" as made in this country, is said to be more perfect than any that can be obtained by other means, and in consequence the goods in either case are more marketable. The lead compounds used are liable seriously to affect the health of the workers, inasmuch as when constantly handled, and especially if inhaled as dust, they give rise to lead poisoning. In order to diminish the cases of lead poisoning special rules have been passed, and to further improve matters the Committee suggest directions in which these rules may be amended and strengthened.

The possibility of substituting other materials for lead in the manufacture of pottery glazes has been under consideration for the last forty years. Nevertheless, up to the present moment it is affirmed by many manufacturers that lead still remains the only substance with which they can produce a perfectly glazed and marketable article. The Committee have considered very fully this part of their enquiry. The witnesses heard by them included twenty who are experienced in the manufacture of pottery, eight concerned in the buying of earthenware and china on a large scale, and sixteen medical men and others. Some leading manufacturers declared that leadless glaze was not suitable for better classes of pottery, and that it raised the cost of manufacture. As a result of the evidence it was suggested to the Committee that a schedule of articles should be drawn up in the manufacture of which the use of lead should be prohibited, but the manufacturers were entirely opposed to the adoption of any such proposal. After reviewing the proposal in all its bearings, the Committee considered that the adoption of the schedule was open to serious objection on account of the difficulty of defining the articles which might be included in it, and the uncertainty that the adoption of the proposal would altogether serve to promote the cause of leadless glazes. In these circumstances, while considering that every possible encouragement should be given to manufacturers to dispense with the use of lead the Committee do not recommend that any attempt should at present be made to prohibit it in the manufacture of certain articles by scheduling them for that purpose.

The general conclusion drawn by the Committee from the evidence in respect of the use of leadless glazes is:—

"That in all classes of pottery ware, whether of the best, medium, or common qualities, a great many articles can be manufactured, in a very high state of perfection, with leadless glaze."

At the same time, however, it appears:—

(*a*) That in certain classes of common ware the cost of production is not appreciably increased, and in the commonest, such as jam pots and the ware known in the trade as "Persian painted," may even be reduced.

(*b*) That in certain other classes, whether of the best or medium quality, leadless glaze, owing to the excessive number of "seconds," can only be used as such at such an increased cost or sacrifice of quality as possibly to entail the loss of important markets.

(*c*) That owing to difficulties relative to accuracy in reproducing old patterns, colours, or methods of decoration, certain kinds of ware cannot at present be made at all without the use of lead.

On these grounds the Committee decided that it was impracticable to make a schedule of articles in the manufacture of which the use of lead should be prohibited.

As to low solubility glazes, the evidence was of such a contradictory character that the Committee found themselves in a very difficult position. The members representing the manufacturers were entirely opposed to any restriction in the use of raw lead; the representatives of the workers, seeing the comparative harmless character of low solubility glazes, would be glad to see them generally introduced, but have to consider the grave risk of loss of employment which any dislocation of the industry due to their introduction might entail.

The report continues:—"Taking, however, the question of glazes as a whole, two facts are beyond dispute. In the first place, the danger to the workers of handling raw lead, whether from direct poisoning or from general deterioration of health, is very real; in the second, it is evident that, however unsuitable leadless and low solubility glazes may be for certain classes of ware, there is a considerable quantity made for which they are quite satisfactory."

The Committee have, however, decided not to recommend the prohibition of the use of raw lead in glazes at the present moment. With regard to the prevention of the danger, they are satisfied that if the precautions which they have agreed to recommend in relation to lead processes are adopted and effectively carried out, they will, in conjunction with those now in force, reduce the risk to a level common to all industrial occupations.

Hitherto the observance of the special rules has been far from satisfactory. In the past many manufacturers have left the initiative to the factory inspectors, and in future they should be made to realise that they are themselves responsible. The Committee have, therefore, endeavoured to attain this object rather than to attempt any such interference with the trade as the prohibition of lead might involve; they accordingly propose that a special method of supervision be adopted for ensuring constant vigilance on the part of the manufacturers in maintaining throughout their works a thorough and continuous observance of the prescribed precautions.

The Committee make definite recommendations for the removal of dust, for good ventilation, and for securing a reasonable temperature in the work-rooms as will be best calculated to minimise the risk of injury to the lungs. They recommend among other regulations the following:—

Wedging of clay which has not been pugged or rolled shall not be done by any person under the age of eighteen, except male workers who wedge clay only for their own use. No woman shall be allowed to do such wedging without a certificate specifying her fitness for this work. Girls under sixteen and boys under fifteen shall be prohibited from carrying clay; except that a boy under fifteen who is working for himself and is not an attendant for another worker shall be allowed to carry such clay as is to be used by himself in making articles. Female young persons over sixteen and male young persons over fifteen shall be allowed to carry only such weights of clay as the certifying surgeon may certify to be reasonable.

The floors of all potters' shops shall be thoroughly cleaned daily, by a moist method.

In mould making shops an exhaust draught shall be provided to prevent the escape of plaster of Paris dust into the air.

All workrooms in which clay or other articles, including moulds, are left to dry, shall be suitably ventilated in such a way that the moisture arising from the articles is carried away from the workers.

Unfritted lead compounds, such as white lead, red lead, or litharge used in the making of frits or glazes, shall not be handled except with at least 5 per cent. added moisture.

In all dipping houses, other than those where leadless glaze or lead glazes of solubility not exceeding 5 per cent. are exclusively used, washable impervious floors, properly sloped towards a drain, shall be provided, and shall be thoroughly cleaned daily. The wall adjacent to any dipping tub shall be tiled or painted with washable paint.

A schedule is given of dangerous processes, and recommendations made applicable to those processes. Rules are proposed affecting periodical medical examinations. A health register is to be kept.

Special precautions are recommended concerning the employment of women in lead processes, and a new system of supervision suggested by which "all occupiers should be made to realise their responsibility in this respect, and be required personally to institute such a system." It is recommended that in every factory the occupier shall appoint a person or persons who shall see to the observance of the regulations as to cleaning floors, work benches, mess rooms, the condition of exhaust draughts, the maintenance of a proper temperature, &c.

With regard to hours of employment they recommend that women and young persons in any scheduled lead process shall not be employed more than 46 hours per week; that adult male dippers, dippers' assistants, and ware cleaners shall not be employed more than 48 hours per week; and that adult male glost placers shall not be employed more than 54 hours per week.

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SUPPLEMENT

"POILITE" ASBESTOS CEMENT TILES.

FOR many years the name of Bell with asbestos has been a guarantee of the best material. Messrs. Bell's United Asbestos Co., Ltd., Southwark Street, London, S.E., have specialised in this class of material for building construction. The "Poilite" Asbestos, Cement, Tile and Sheet Works, of which they are the owners, are the sole works of the kind in England, and have been fully equipped for the increasing demands of the home, colonial, and foreign trade. Within the past ten years factories have been opened in Austria, Hungary, France, Germany, Belgium, Switzerland, and the United States.

"Poilite" roofing tiles possess many sterling qualities. They do not change colour under exposure and are fireproof; they do not crack or split when tramped on or exposed to heat; they do not deteriorate under the most changeable weather conditions at home or abroad; they will not split or crack round the nail hole, and last but not least they present an attractive appearance.

During the process of manufacture the shingles are subjected to an enormous pressure. They absorb when fresh only about 4 or 5 per cent. of their weight of water. When exposed to the atmosphere from year to year the hydration and subsequent crystallisation which take place converts them into an absolutely waterproof covering, the life of which is practically interminable.

Owing to the extreme lightness of weight of "Poilite" the roof framework may be of a much lighter construction than that for slate roofs.

We have received samples of a new material known as "Poilite" asbestos cement in slabs and roof tiles of various tints, and about $\frac{3}{16}$ inch thick. Externally and to the touch they resemble high quality slates, but they are of greater tensile strength and lighter. The surface is uniform, smooth, and non-flaking, and they can be easily cut into shapes and drilled. The average weight is about 21 lbs. per square yard, allowing for $2\frac{3}{4}$ inches lap, compared with 67 lbs. of Welsh slate and 160 lbs. of red roof tiles. The smoothness of the surface and the accuracy with which the edges are cut must prevent damp, rain, wind, or snow entering between the laps. Nor do they appear likely to crumble, scale, or to be affected by changes of temperature.

They are made in grey, blue, and terra-cotta, and the colours are warranted unfading. There is undoubtedly an opening in the tropics for a substitute for galvanised iron. "Poilite" offers such a substitute not only for roofing, but also for walls, dadoes, and ceilings. On account of its lightness and durability it is well suited for the export market.

"Poilite" is on the authorised Admiralty and War Office lists, and large roof areas have been executed with the material in both foreign and home stations. The contracts carried out in asbestos cement roofing slates point to the material being economical, and even in Wales the material is in high favour. For panels and ceilings "Poilite" sheets are supplied in sheets measuring 8 feet $2\frac{1}{2}$ inches by 4 feet by $\frac{3}{16}$ inch or $\frac{5}{8}$ inch thick, and being light, easily erected, and an absolute non-conductor of heat its use in British India and other tropical countries is already very extensive. For this purpose it is eminently suited, as it resists the attack of white ants, is quite non-combustible and economical.

YAXLEY parish church, Hunts, which has been restored at a cost of nearly 8,000*l.*, was re-opened on Sunday last. The restoration included the underpinning of the foundations, the re-roofing of chancel and nave, the repair of tower and spire, and the reglazing of the windows throughout. The old Jacobean pulpit was returned to the church by the late Lord Carysfort, its lay rector, and another addition is the recovery of the design for the rood stone staircase and the rood loft destroyed at the Reformation.

THE Birmingham education committee report that many of the older Council schools erected by the late School Board do not conform to the present standard of the Board of Education's requirements because there are no halls in which to assemble children, and the main rooms are regularly used for a number of classes, and form part of the recognised accommodation of the schools. In the infants' departments the work of the school is seriously hampered by so many classes having to be regularly taken in the main rooms. Several of the schools have been in operation between thirty and forty years, and it is proposed gradually to bring them up to present-day requirements at the rate of two a year.

THE RELATION OF WATER SUPPLY TO SEWERAGE AND SANITATION.*

THERE is no article of such vital importance to human life as water, nor one that is more freely wasted with indifference and impunity, notwithstanding the increasing difficulties of obtaining and maintaining constant supplies of pure water for the populations of our large towns. It ought to be one of the axioms taught in all elementary schools that no man is rich enough to afford to waste anything, not even water, and that true economy is not meanness.

There is no scarcity of water, but below a certain contour level, which varies with the district, all surface water is more or less polluted, and any proposal to impound or otherwise deal with upland waters for town supplies meets with fierce opposition from claimants, of whose existence no one dreamed beforehand, and who claim compensation either in money or water out of all proportion to the scheme. It therefore devolves upon all authorities concerned to educate public opinion in this matter, to use every available means of preventing and controlling waste, so that a constant supply can be maintained. An intermittent supply is both wasteful and a source of danger to the community.

The great improvements in water fittings and sanitary apparatus during recent years, have, in the majority of cases, presupposed an abundant supply of water; that is specially so with regard to baths, school closets, and urinals.

The water supply of water-closet towns varies between 20 gallons and 40 gallons per head per day in the United Kingdom, and a large percentage of these quantities represents waste.

A long experience of town water supply has led the author to the conclusion that it is the dirty people who waste most water; some years ago he fixed a meter on a service supplying a new cottage occupied by a working man, his wife, and four children, all scrupulously clean, the wife doing all the family washing, and the result of twelve months' test was that they consumed 7 gallons per head per day. During the same period a meter, fixed on a supply to one of the dirtiest courts in the lowest part of the city registered 42 gallons per head per day of the population supplied. In the first case the cottage was provided with $2\frac{1}{2}$-gallon flush-box to the w.c., a copper in the scullery, but no fixed bath, and in the case of the court there were two common washhouses, with water laid on, and three w.c.'s, each provided with flushing boxes.

Before the installation of the Deacon meter system of inspection for waste, in 1883, the total consumption of water in Gloucester amounted to 32 gallons per head per day of the then poulation of about 35,000; since that date it has been maintained between 16 and 22 gallons per head per day, and is now 20 gallons on a population of 55,000.

The Deacon meter system is well known, and it is surprising that it is not more generally adopted, as the results, when the system is properly worked, are quite equal to those obtained by a separate meter on each service, while the difference in cost is enormous.

Many people think that waste of water is beneficial, especially to the drains and sewers, but this is an error, because although the waste amounts to large quantities in the aggregate, it is so distributed over large areas in continuous dribbles throughout the twenty-four hours of each day, that its cleansing effect is lost, and when all this waste water has to be pumped to supply the town, and then again to be pumped and treated as sewage, the loss and expense are enormous at both ends.

All w.c.'s should be provided with flushing boxes, and if intercepting traps were absent from the house drains, a two-gallon flush would be sufficient with a syphonic discharge action, but in the presence of this obstruction, $2\frac{1}{2}$ or 3 gallons are required. Up to quite recently the general practice has been to insist on 6-inch house drains, but now drains are tested for watertight joints, 4-inch pipes are being largely used, and are amply sufficient for a large detached house, a semi-detached pair, or even a block of four small houses. Owners should be encouraged to build in pairs, and not in terraces, or if land is too valuable, open passages should be insisted on at intervals for bringing the drains through without passing under the dwelling-rooms.

A 4-inch pipe drain contains 0.54 gallon per foot of length, when running full, and if laid at a gradient of 1 in 48, or $\frac{1}{2}$ inch per pipe, will discharge 130 gallons per minute, at a velocity of 240 feet per minute, whereas a 6-inch pipe contains 1.22 gallons per foot of length, and laid at the same gradient,

* A paper read by Mr. R. Read, A.M.Inst.C.E., city surveyor, Gloucester, before the Incorporated Association of Municipal and County Engineers, at the thirty-seventh annual meeting held at Plymouth.

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1 in 48, will discharge 356 gallons per minute, at a velocity of 292 feet per minute; this shows that a 2-gallon flush, which is comparatively lost in a 6-inch pipe, is very effective in a 4-inch pipe, as it fills a length of about 4 feet.

The combined discharges from the w.c.'s, sinks, and bath wastes pass through the house drains and flush the sewers to the outfall, and the aggregate length of the drains being four or five times that of the sewers to which they are connected, it follows that water used in flushing from the w.c.'s is more efficient, bulk for bulk, than water used in sewer flushing only by the municipal authorities, which does not and cannot pass through the drains.

The trough closets and urinals provided for large schools and other public institutions are very wasteful of water; they are generally flushed from automatic tanks containing from 20 to 50 gallons, which are filled by a bib tap, set by guess-work, to discharge the tank perhaps three or four times per hour, and frequently this goes on night and day until the water inspector discovers it. All w.c.'s should be of the pedestal pattern, separately flushed and the seats hinged so that the w.c.s can also be used as urinals, and so avoid the large evaporating surfaces of the ordinary urinal range, which requires so much flushing to obtain even moderately sanitary results. The hinged seats of the w.c.'s can be balanced if necessary, to remain in the vertical position when so required, and the action of rising and falling can be used to discharge the flush.

The ordinary slipper bath, fixed in good houses, requires anything between 30 and 70 gallons of water for each user, and if the habit of taking a complete daily bath, which is rapidly increasing, were to become universal, the water supplies of the country would be severely taxed, unless some more economic apparatus is provided. The use of the hip bath, or Oxford bath, should be encouraged, as it only requires 3 gallons of water for a complete sponge bath. A pail full of water carried up over night provides for a cold bath in the morning. Then again, a shower bath, properly constructed, can be made to provide both hot and cold baths with great cleanliness, efficiency, and economy of water, but architects, builders, and plumbers go on fixing slipper baths and make no attempt at developing the shower, except as an addition to the extravagant slipper bath.

Every housewife who knows her business appreciates a good supply of soft water, but it is quite an exception to see rain-water tanks provided in modern houses, and as the surface wells in any district are closed, and superseded by a town supply, the pumps are frequently taken away as a credit against the cost of laying in the town service.

Borough engineers can often relieve the waterworks by obtaining water for flushing purposes and street watering from brooks, rivers, canals, or the sea. At Gloucester, where the electric light railway crosses the River Severn at Westgate Bridge, the author put up a 5,000-gallon tank, raised on stanchions, which is filled by a 3-inch centrifugal pump driven by an electric motor, the current being taken from the trolley wire of the tramway, and the switch for starting and stopping the motor is worked by a float in the tank. The overhead tank supplies a 2,000-gallon water van which runs on the tramway in the same way as a passenger car, and waters the whole width of the road over a route of nine miles. Our ordinary water vans for that district also draw water from this overhead tank, and a great saving of time and labour is effected.

Water from these sources can also be used for sewer flushing, and a large economy on this work can be made if the borough engineer confines the flushing to those sewers which he knows are not self-cleansing in dry weather, instead of having a regular rota of flushing at intervals throughout the district, whether it is required or not, and regardless of the condition of the weather.

Town water supplies should be the property of the sanitary authorities; it is one of the least objectionable forms of municipal trading, enabling the authority to provide public swimming and other baths which are so necessary to the health, comfort, and enjoyment of the town populations. Here again many economies can be made; in the more modern swimming baths provision is made for pumping the water from the deep end up to the roof, where it passes through an aerator, is then filtered through a mechanical filter, and finally warmed before passing into the shallow end of the bath, the waste steam from the pumping engine being utilised for warming the water. Well water and rain water can often be used for baths, or where a stream, river, or canal is available a floating bath or one through which a stream flows constantly can be arranged for use during the summer months, to the great relief of the baths supplied by the town service.

There is little doubt that the domestic supply of a town should not exceed 16 gallons per head per day, and all over that is waste; the trade supply may be anything up to, say, 6 gallons per head per day, that is to say that no town supply in the United Kingdom should exceed 22 gallons per head per day, unless the trade demands exceed the above quantities. If the water saved is sold at any figure between 6*d.* and 1*s.* per 1,000 gallons, it is easy to see what a profitable business the saving of even one gallon per head per day is to any town.

Of course a great deal depends upon the quality and strength of the pipes and fittings which are allowed to be used, and none but competent plumbers should be allowed to either fix or repair water services or fittings connected therewith.

The question of water supply in this country is one of increasing importance, and it is desirable that in the near future River Conservancy Boards should have larger powers to enable them, in conjunction with the town and county councils, to construct waterworks and flood-prevention works as well as to control the navigation, prevent pollution, and preserve the fishing industry.

ARCHITECTURE IN NEW SOUTH WALES.*

State Reformatory for Females at Long Bay.—This extensive group of buildings, whose erection (for reasons beyond the control of the Branch) has extended, at intermittent periods, over a series of years, is practically completed, and arrangements have been made for immediate occupation.

In 1897, when the Government Architect was last in England, a visit was paid to the then newly-established prison for females at Aylesbury. While carefully avoiding all reference to the Government policy, which established this gaol, and to its administration when established, but little was found as regards the structure of the buildings and their arrangements which would be of use in designing a similar gaol in New South Wales, but, on the other hand, a great deal to avoid.

These buildings were, at the time of the visit, the old county gaol patched up and made to do for the purpose, but the obsolete fittings would not be admitted for use at Long Bay.

The latter was therefore designed strictly without a precedent and wholly for adaptation to the system of congregation and treatment of female prisoners in this State.

The general description of the buildings and the detailed arrangement of one wing may be described as follows:—

The buildings are of brick with stone dressings and in general are roofed with iron. The reformatory proper occupies nearly four acres of ground, and consists of four cell ranges, each accommodating seventy-two prisoners in separate cells; a small cell range for diseased prisoners, &c., two sewing rooms, the kitchens, washhouse, workshop, the hospital block, warders' quarters, and the entrance.

The plan is so arranged that the cell ranges, sewing rooms, and kitchen block all radiate from a common centre. Between these blocks are situated the exercise yards, and in the centre of all is a large shelter-shed in which prisoners may be interviewed, and which is surrounded by garden plots.

The cell ranges are of two floors, and consist of a corridor 14 feet 6 inches wide and the full length of the building, with a 4 feet wide gallery all round at the first floor level; on either side of the corridor are situated the cells, each measuring 13 feet by 7 feet by 10 feet 6 inches high. The galleries are of steel, as is the staircase to same, which rises in the centre of the corridors and communicates with the gallery on either side. At the end of the corridor, opposite the entrance, are situated the bathrooms, each of which is provided with a plunge and shower bath, and hot and cold water is provided. The cell ranges are floored with concrete, the surface in the cells being of timber and asphalt elsewhere. Each cell has a window communicating with the outer air, and is provided with electric light and electric bell.

The hospital provides accommodation for twenty-six patients. The kitchen is fitted with the latest steam-cooking appliances. The whole of the area not occupied by buildings or exercise yards is laid out in garden plots for both flower and kitchen purposes. The footways are tar-paved with central portion formed of silicate paving. The whole of the foregoing buildings, &c., are surrounded by a substantial brick wall, 18 feet in height, and which extends from each side of the entrance block.

The entrance block is of handsome design and, as the name implies, provides the entrance way to the reformatory proper. In this block are situated the guard room, visitors' rooms, prisoners' admission and bathrooms, clothes store, and fumigating rooms, and also certain rooms for the warders, &c.

Outside the walls are situated the governor's and matron's residences and also four cottages for married warders. A

* Abstract from the annual report of Mr. W. L. Vernon, chief of the architect's branch of the N.S.W. Department of Public Works.

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new roadway has been made and a tramway provided whereby the prisoners are conveyed within the walls of the prison. The whole of the buildings are lighted throughout by electricity, and hot water and steam-heat are provided. The City water is laid on, and the whole of the sewerage is disposed of by septic tanks.

State Colleges and Schools.—Very considerable sums of money have been expended recently by the State in the development of its school buildings, and the coming year promises to be, if anything, a period of still greater activity.

The general system of State education has been within the last few years practically revolutionised, and is still in a transitional state. Better classification of scholars is adopted and teaching is given to smaller numbers and in separate class-rooms instead of, as formerly, in the aggregate and in large single rooms fitted with long forms. Special accommodation and appliances are now in many cases provided for the teaching of science and technical industries, while the questions of hygiene, sanitation, and the preservation of eyesight are fully provided for in the new buildings, and, so far as it is possible, by means of alterations and additions, in those of older and more obsolete type. In metropolitan and municipal areas increased attendance has necessitated the construction of fire-resisting staircases and safer exits.

These above-stated circumstances have been observed by the Public Works Department in carrying out the instructions of the Public Instruction Department as follows:—

1. Designing of schoolhouses with accommodation for a full roll of scholars in medium-sized class-rooms in lieu of the older form of large schoolrooms.

2. Arrangement of plan so that the lighting of the class-rooms is on the left-hand of the scholars, sometimes involving considerable elaboration of plan.

3. Increasing the standard floor space per older scholar from 8 feet to 10 feet and 12 feet.

4. Including central halls for general assembly in addition to the class-room accommodation.

5. Erection of science and technical training rooms specially fitted up.

6. Improved ventilation.

7. Planning so that the improved and elaborated desks, seats, and general fittings furnished by the Department of Public Instruction can be suitably placed.

8. Construction of fire-resisting staircases in the larger schools, with increased means of exit and generally better appointments.

9. Improved and increased latrine and lavatory accommodation in compliance with the requirements of the Water and Sewerage Board, municipal, and shire regulations.

10. Adoption of Public Works Department methods and specifications for the erection of permanent school buildings.

It may be generally stated that money formerly spent in the more obsolete school buildings in the erection of towers, turrets, Gothic windows, and elaborate details, &c., is now expended in the above-mentioned more practical directions.

English and American Schools.—The mean cost of three schools in London under the London School Board:—Church Manor (Greenwich), Mitcham Lane (Greenwich), Stanstead Road, average 13*l.* 17*s.* per head.

The mean cost of seven schools under County Councils:—Burslem School, Hornsey School, Gloucester Board School, Chesterfield Board School, Birmingham School, Glyn and Neath Schools, Wolverhampton School, average 12*l.* 6*s.* per head.

In making a comparison, it should be noted that building costs practically about 25 per cent. more in New South Wales than in England.

From the information available, American schools may be reckoned at one-fifth extra cost over those in New South Wales.

Other technical buildings, such as the Mitchell and Fisher Libraries, the Australian Museum, the Registrar-General's Offices, general and county hospitals, new abattoirs, and service buildings such as schools, police stations, court-houses, fire stations, lighthouses, &c., for the State Government, and Post Offices and Military Rifle Ranges, and buildings and Ordnance Stores for the Federal and Imperial Governments, have in the same way been dealt with; wherever precedent was good and applicable it has been followed, and where fresh departures were found necessary and desirable, original designs have been encouraged, and the beaten track departed from.

Nos. 3 and 4.—Use of improved materials and methods of construction and the application of business methods in building operations.—In all these points the greatest care has been taken to obtain for the Department the full advantage of the most recent improvements in building construction, particularly with regard to the use of reinforced concrete and fittings of the latest type, and ample information is placed in the hands of the officers of the Department by means of technical journals, personal inspections, and general trade information.

With regard to business methods in building operations, it is necessary to observe departmental procedure, but which, while securing absolute correctness in transaction, does not always expedite the work. At the same time the Department takes advantage of the results of the keenest competition between contractors, and purchases its materials in the cheapest market.

As a whole, it may fairly be claimed the Government buildings of this State are correctly designed from an architectural point of view, and are applicable for their several purposes, and being of a substantial character, may be considered as an undeniably good item in the assets of the State.

There is one disability under which the monumental and more important of the public buildings suffers, and that is the absence of continuous building policy, resulting in many of these buildings being erected in sections and at different periods, involving, it is feared, in some instances, otherwise avoidable expense, and making their completion the subject of circumstances, and not as part of a continuous policy.

As the State grows yearly in wealth, it may be confidently anticipated that its public buildings will also grow both in importance, artistic merit, and in their technical usefulness.

NEW L.C.C. COUNTY HALL SITE.

THE Society of Engineers (Incorporated) made their third vacation visit of the present session to the site of the new County Hall of the London County Council on the south side of the Thames at Lambeth.

The site for the building occupies an area of over five acres, of which about one and a half acres is reclaimed from the River Thames, and is bounded on the east side by Belvedere Road, and on the south by Westminster Bridge Approach.

The river is excluded by an embankment wall similar to the Victoria Embankment on the opposite side of the river. The embankment wall is founded on the London clay formation at a depth of about 20 feet below Ordnance datum, and the whole area behind the wall is to be covered with a raft of concrete 5 feet thick, resting on the Thames ballast at a level of 8 feet below the same datum. On this raft the building will be erected.

The embankment wall is being built behind a cofferdam consisting of a single row of Oregon pine piles, 14 inches square, grooved and tongued, which are driven about 12 feet into the clay. The wall is of 6 to 1 Portland cement concrete, faced with Cornish and Aberdeen granite above low-water level. In front of the central portion of the future building the wall has two flights of steps leading down to the river, and the granite is finished with a rough face. Behind the wall is a series of arches forming storage vaults, and on the top of them will be a terrace, access to which will be by a flight of steps from Westminster Bridge.

Special precautions were taken in constructing the foundations of the new wall near the abutment of Westminster Bridge, The bridge is founded on cast-iron piles, and, in order to avoid any possibility of weakening this support, a length of 30 feet of the wall next the bridge was founded in a caisson, which was sunk with compressed air. The foundation of the abutment was also partly surrounded with steel sheet piling driven down to the London clay.

The embankment wall has been designed and is being constructed under the supervision of Maurice Fitzmaurice, Esq., C.M.G., the Chief Engineer to the London County Council, the contractors being Messrs. Price & Reeves. The raft foundation is being laid by Messrs. F. & H. F. Higgs, under the supervision of W. E. Riley, Esq., F.R.I.B.A., the Council's superintending architect, who is also associated with the architect for the whole scheme, Ralph Knott, Esq.

HIS MAJESTY'S Government have undertaken to contribute to the Palace of Peace at The Hague the four large upper windows of stained glass of the great Hall of Justice.

THE Southampton Harbour Board have accepted revised plans, prepared by the surveyor, for the enlargement and alteration of the Pier Pavilion, at a cost of about 4,000*l.*

MR. WILLIAM ADAMS MURPHY, of Eliot Lodge, Sydenham, Kent, architect and surveyor, who bequeathed the residue of his estate to the Hospital for Sick Children, Great Ormond Street, left 29,867*l.*

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Cathedrals and Abbeys of England—continued.

CHESTER.

View from South-East	January 1, 1904
Tower, Flying Arches and Buttresses	January 15, 1904
Mosaics in Aisle	January 29, 1904
The Cloisters. Doorway in Cloisters	February 12, 1904
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Detail of Choir Stalls	April 1, 1904
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Vestibule to Chapter-House. Window and Door at South End of West Aisle of South Transept	May 6, 1904
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West End of South Wall of Refectory, and North-West Angle of Cloisters	June 3, 1904
Clerestory of Nave and Flying Buttresses. North-West Porch and Base of North-West Tower. Doorway at West End of Nave. Abbey Gateway	June 10, 1904
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General Exterior (North Side) ...	September 9, 1904
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South Aisle from East End ...	December 2, 1904
Chancel from Nave	December 9, 1904
North Side of Choir	December 16, 1904

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CARLISLE—*continued.*

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Full-Length View Westwards ..	June 26, 1908

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West Front	October 9, 1908

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The Baptistery	November 20, 1908

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North Side of Nave	March 11, 1910
The Sanctuary	March 18, 1910
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West Door	March 25, 1910

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THE

Architect and Contract Reporter.

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The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

BELFAST.—Sept. 5.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

ECCLES.—July 18.—The Corporation invite applications from architects residing in or having a permanent place of business in Manchester, Salford, or Eccles willing to submit competitive designs for the extenson of public baths in Cromwell Road, Patricroft. The Corporation will select not more than nine of the applicants to submit designs. The following premiums will be awarded, viz.:—(*a*) To the architect whose design is placed first the execution of the work, or in the alternative 20*l.*; (*b*) to the architect placed second, 10*l.*; (*c*) to the architect placed third, 5*l.* Applications endorsed "Architect" to be delivered by 10 A.M. on the 18th inst. to Mr. Edwin Parkes, town clerk, Town Hall, Eccles.

GORLESTON-ON-SEA.—August 31.—The Governors of the East Anglian Institution for Blind and Deaf Children invite plans and designs for a new building to be erected at Gorleston-on-Sea. The competition will be confined to architects having an office or residing in the areas of the following education authorities:—Cambridgeshire, Isle of Ely, Lowestoft, Norfolk, Norwich, East Suffolk, and Great Yarmouth. Copies of the instructions to architects within the prescribed areas will be sent on a remittance for 10*s.* (returnable). Documents to be sent back. Mr. D. O. Holme, clerk of the governors, Castle Chambers, Norwich.

IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

SCOTLAND.—The committee of Buckhaven Co-operative Society, Ltd., is prepared to receive competitive plans for proposed extension to bakery premises. Full particulars may be had from the Manager, Randolph Street, Buckhaven.

WINCHESTER.—July 25.—Architects practising in Hampshire. Designs for elementary school buildings to accommodate 330 children. Premiums of 50*l.*, 30*l.*, and 20*l.* Particulars from Mr. Thomas Holt, town clerk, Guildhall, Winchester.



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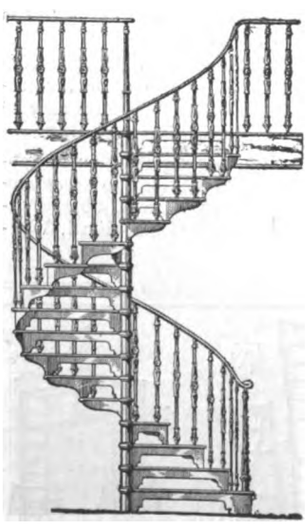
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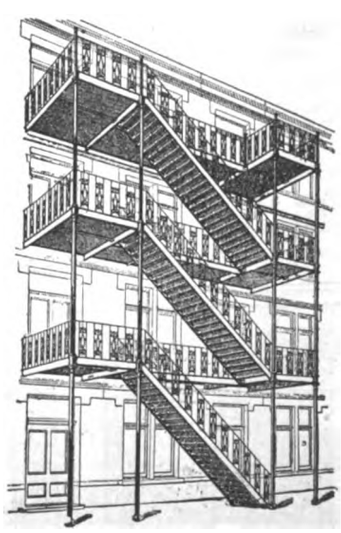
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CONTRACTS OPEN.

ACCRINGTON.—July 20.—For erection of a cart shed at the rear of the Corporation stables in Moreton Street. Mr. W. J. Newton, C.E., borough engineer, Town Hall, Accrington.

ARTHINGTON.—For the various works required in additions and alterations to Arthington Church school, Yorks. Mr. Samuel Stead, architect, 33 James Street, Harrogate.

ASHBURTON.—July 18.—For additions to the infants' school cloak-room at the Ashburton Council school. Mr. H. M. Firth, correspondent, Ashburton, Devon.

ASHTON-UNDER-LYNE.—July 25.—For the works required in erection of the new savings bank. Messrs. W. H. George & Sons, architects, 7 Warrington Street, Ashton-under-Lyne.

AYLESBURY.—July 20.—For sundry repairs required at the Union House. Mr. F. H. Parrott, clerk, Bourbon Street, Aylesbury.

BRADFORD.—July 20.—For the erection of the new church of St. Margaret, in Leeds Old Road. Send names by July 20 to Mr. Crawford Hicks, architect, 5 John Street, Adelphi, London, W.C.

BEDFORD.—July 21.—For repairing work at various Council schools. The County Surveyor, Shire Hall, Bedford, or at the schools.

BELFAST.—July 18.—For rebuilding Argyle Place Presbyterian church. Deposit 1*l.* 1*s.* Mr. A. Ferguson, Scottish Provident Buildings, Belfast.

BELFAST.—July 25.—For building a warehouse in Bedford Street. Deposit 2*l.* 2*s.* Messrs. Watt, Tulloch, & Fitzsimons, architects, 77A Victoria Street, Belfast.

BENTLEY.—July 22.—For erection of eight houses at Bentley, Yorks. Apply by July 19 to Mr. John W. Wilson, architect, Goldthorpe, near Rotherham.

BLAYDON.—July 19.—For erection of a secondary school at Blaydon (sole tenders), Durham. Mr. W. Rushworth, county education architect, Shire Hall, Durham.

BRADFORD.—July 16.—For the following works, for the Corporation, viz.:—(1) Bolton Lane abattoirs, alterations and repairs; (2) St. James's market, erection of seven shops and seven store-rooms (vegetable market extension). The City Architect, Town Hall, Bradford.

BRADFORD.—July 18.—For the following work at Bradford court-house, viz., alterations, &c. (builder, joiner, plasterer, plumber, painter). The West Riding Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

BRAMPTON.—July 16.—For erection of five single cottages and ten sets of farm buildings, situate in Warboys Fen, Farcet Fen, Yaxley Fen, Ponder's Bridge, Ramsey, and Upwood Common Farm, near Ramsey Heights, for the small holdings and allotments committee of the Huntingdonshire County Council. Mr. S. Croot, land steward, Brampton, Hunts.

BRIDPORT.—July 19.—For erection of a stable at Bridport Station, for the Great Western Railway. The Engineer at Taunton Station.

BRISTOL.—July 19.—For reglazing, reslating, and repairing portions of the roof of the joint station at Bristol, for the Great Western and Midland Railways joint committee. The Engineer, Bristol Joint Station.

BRISTOL.—July 21.—For making alterations, &c., to Nos. 1, 2, 3, and 4 Royal York Crescent, Clifton, and converting into residential flats. Mr. Henry Williams, architect, Alliance Chambers, Corn Street, Bristol.

CLIFFE.—July 16.—For the execution of summer repairs at the Cliffe Cooling Street Council school. Mr. F. Wright, hon. correspondent, West Court, Cliffe, Rochester, Kent.

CLITHEROE.—July 18.—For the various works necessary in erection of a "bothy" at Higher Standen. Mr. Edmund T. Welch, architect and surveyor, York Street, Clitheroe.

DARTFORD, &c.—July 20.—For the following works, viz.:—(1) Repairs and preservation works at Long Reach (Smallpox) Hospital, Dartford; (2) road repairing and tar paving work at the Northern (Convalescent Fever) Hospital, Winchmore Hill, N. Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief. Deposit 1*l.* each contract. The Metropolitan Asylums Board, Embankment, E.C.

DEWSBURY.—July 19.—For erection of a boiler chimney at Meadow Mills. Mr. D. K. Lobley, architect, 58 Alexandra Crescent, Dewsbury.

DODDINGTON.—July 16.—For the execution of summer repairs at the Doddington Council school, The School, Doddington, Kent.

DURHAM.—July 19.—The Durham County Council invite sole tenders for (1) Cassop new school and extensions at Horden Colliery, Mr. W. Rushworth, Shire Hall, Durham; (2) alterations at Fulwell Council school, Mr. F. E. Coates, Shire Hall, Durham; (3) removal of the iron school, accommodation about 500 scholars, from Shotton colliery, and re-erection of the same at Blackhall Rocks. Mr. F. E. Coates, Shire Hall, Durham.

EASTBOURNE.—July 18.—For additions to the sanitary inspector's office, Town Hall. Mr. Wm. Chapman Field, borough architect and building surveyor, Town Hall, Eastbourne.

EAST STONEHOUSE.—July 20.—For sundry alterations and works at the workhouse infirmary, &c., East Stonehouse, Devon. Messrs. Thornely, Rooke & Barron, architects, 11 The Crescent, Plymouth.

EDINBURGH.—Contractors desiring to tender for the new building, Freemasons' Hall, will kindly send their names to the architect. Mr. A. Hunter Crawford, F.R.I.B.A., 10 Randolph Place, Edinburgh.

FLIMBY.—July 25.—For the various works required in erection of ten cottages at Flimby, Cumberland. The Maryport Co-operative Industrial Society, Ltd., Central Stores, Maryport, also Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

FRASERBURGH.—July 18.—For the mason, carpenter, slater, plumber, plasterer, painter, and glazier works of dwelling-house to be erected on Strichen Road. Mr. Wm. S. F. Wilson, architect, Broad Street, Fraserburgh, York.

GILLINGHAM.—July 18.—For extending Barnsole Road and Napier Road Council schools. Mr. J. L. Redfern, A.R.I.B.A., surveyor to the education committee, Council Offices, Gardiner Street, Gillingham, Kent. Send 10*s.* 6*d.* deposit to Mr. Andrew Johns, secretary, 4 Gardiner Street, Gillingham.

GLASGOW.—July 25.—For the erection of the concert hall at the Scottish Exhibition of National History, Art, and Industry, 1911. Deposit 3*l.* 3*s.* with the Secretary, 190 West George Street. Messrs. Walker & Ramsay, architects, 108 Douglas Street, Glasgow.

GLASGOW.—July 26.—For supplying and laying the copper roof at Glasgow Cathedral, for the Commissioners of H.M. Works and Public Buildings. The Clerk of Works at the Cathedral. Send 1*l.* 1*s.* deposit to H.M. Office of Works, 3 Parliament Square, Edinburgh.

GLOUCESTER.—July 23.—For erection of a cottage at Frampton Cotterell, and for alterations and repairs at the Leigh Farm, Pucklechurch. Mr. Francis Peter, Shirehall, Gloucester.

CRUMPSALL.—July 23.—For the construction of retaining walls adjoining the workhouse. Send 2*l.* 2*s.* deposit to the City Treasurer, Manchester. The City Surveyor's Office, Town Hall, Manchester.

HAYDON BRIDGE.—Aug. 3.—For the work of remodelling Haydon Bridge Shaftoe Trust school. Send names by July 20 with 2*l.* 2*s.* deposit to Mr. Edwarl Davidson, clerk to the governors, Estate Office, Haydon Bridge.

HEIGHINGTON.—July 18.—For alterations at the Wesleyan chapel and schools. Messrs. Kitching & Lee, architects, Houndgate Chambers, Darlington.

HOO ST. WERBURGH.—July 18.—For summer repairs at the Hoo St. Werburgh Mixed Council school, Kent. Mr. R. A. Arnold, correspondent, The Precinct, Rochester.

HULL.—July 20.—For erection of a small pump house, in ferro-concrete and brickwork, and for laying about 200 yards pipe sewer at the Northern Cemetery. Mr. A. E. White, M.I.C.E., city engineer, Town Hall, Hull.

HULL.—July 20.—For work to be performed in erection of stables, cart shed, &c., Pickering Park. Deposit 2*l.* 2*s.* Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

KEIGHLEY.—For the several works required in erection of a weaving shed at Aireworth Mills. Messrs. R. B. Broster & Sons, architects and surveyors, Craven Bank Chambers, Keighley.

LANCASTER.—July 19.—For the tiling and joiners' work in connection with the renovation of the three top butchers' shops in the market, adjoining the common Garden Street entrance. Mr. John C. Mount, borough surveyor, Town Hall, Lancaster.

LEYTONSTONE.—July 21.—For erection of an additional storey to the engineer's house at the Infirmary, Whipp's Cross Road, Leytonstone, N.E., for the Guardians of West Ham Union. Mr. Thomas Smith, clerk, Board Room, Union Road, Leytonstone.

LONDON.—July 18.—For the construction of an underground public convenience in Barrett Street, near its junction with James Street, Oxford Street, for the St. Marylebone Borough Council. Mr. J. Paget Waddington, M.I.C.E.,

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borough engineer and surveyor, Town Hall, Marylebone Lane, London.

LONDON.—July 19.—For repairing and painting portions of the roof of Paddington Station, for the Great Western Railway Co. The office of the Engineer, 7 Eastbourne Terrace, Paddington.

LONDON.—July 21.—For erection of the Western Central District Post Office extension. Mr. J. Rutherford, H.M. Office of Works, Carlisle Place, S.W. Send 1*l.* 1*s.* to H.M. Office of Works, Storey's Gate, London.

LONDON.—July 21.—For erection of a new school at Pitshanger Lane, North Ealing. Deposit 5*l.* 5*s.* Mr. Charles Jones, M.I.C.E., borough engineer, Town Hall, Ealing.

LONDON.—July 27.—For pulling down a portion of 160 King Street, Hammersmith, and erecting a new shop front, &c., on the line of the street improvement, for the Borough Council. Mr. H. Mair, borough surveyor, Town Hall, Hammersmith.

LONDON.—July 28.—For the construction of exit iron staircases and the necessary structural alterations in connection therewith at the St. George's Workhouse, Mint Street, Borough, S.E. Deposit 1*l.* 1*s.* Mr. A. J. Wade, architect, 104 Harvist Road, Brondesbury, N.W.

MARDEN.—July 29.—For the execution of summer repairs at the Council school. Mr. T. A. Fowle, West End Villa, Marden, Kent.

MORETONHAMPSTEAD.—July 16.—For erection of a general post office and a block of dwelling-houses at Moretonhampstead. Send names and a deposit of 2*l.* 2*s.* to Mr. Ernest E. Ellis, architect, Exmouth.

NOTTINGHAM.—July 18.—For alterations and additions at Carrington Council school, Claremont Road. Deposit 2*l.* 2*s.* Mr. Frank B. Lewis, city architect, Guildhall.

OSWALDTWISTLE.—July 30.—For erection of a riding school and alterations to existing headquarters of the 5th Lancashire Battery of the 1st East Lancashire Brigade Royal Field Artillery at Oswaldtwistle. Deposit 10*s.* Mr. William Greenwood, A.R.I.B.A., architect, Victoria Chambers, Victoria Street, Blackburn.

POCKLINGTON.—July 26.—For repairs, renovation, and certain alterations required to the school premises, for the Governors of the Pocklington Grammar school. Mr. Thomas Robson, solicitor, Pocklington, Yorks.

POOLE.—July 18.—For (*a*) erecting additional class room, &c., at the Secondary school, Seldown, and making alterations; (*b*) for painting exterior, &c., for the education committee. Mr. Samuel J. Newman, F.R.I.B.A., borough surveyor, Municipal Offices, Market Street, Poole.

PRESTON.—July 18.—For the concrete, brick, and stonework required in building a brick culvert 7 feet internal diameter, for the Corporation. The Borough Surveyor, Town Hall, Preston, Lancs.

SALFORD.—July 21.—For pulling down and clearing away five cottages in Brunswick Street, and the construction of yards, w.c.'s and sculleries to adjoining property. The Borough Engineer's Office, Town Hall, Salford.

SCOTLAND.—July 18.—For the mason, joiner, plumber, and slater work required for taking down and rebuilding cottage at Baikie, in the Parish of Airlie. Mr. D. Ross, Road Surveyor, Kirriemuir.

SCOTLAND.—July 19.—For the mason, joiner, plumber, plaster, slater, glazier, and iron works of reconstruction of dormitory at the Dundee District Asylum, Westgreen. Mr. T. Martin Cappon, F.R.I.B.A., 32 Bank Street, Dundee.

SCOTLAND.—July 27.—For mason, joiner, slater, plasterer, and plumber work in connection with the proposed supplementary class-rooms, for the Brydekirk School Board. Apply by July 23 to Mr. Fred. W. Moffat, Clerk, School Board Office, Kirtlebridge.

SCOTLAND.—July 27.—For the mason, carpenter, plaster, and slater works of alterations and additions to the dwelling-house at Brownhills, Hatton, Fintray. The tenant at Brownhills.

SCOTLAND.—Aug. 4.—For the mason, joiner, plumber, plasterer, slater, glazier, painter, heating and steel-work, of new premises, Bank Street, Lochgelly, for the Equitable Co-operative Society, Ltd. Deposit 1*l.* 1*s.* Messrs. A. Scobie & Son, architects, Dunfermline and Lochgelly.

SHIPTON BELLINGER.—July 20.—For the erection of a Council school for ninety-nine children, and teacher's house. Deposit 2*l.* 2*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

STAFFORD.—July 20.—For erection of builders' work in connection with a workshop extension for Messrs. Siemens Brothers Dynamo Works, Ltd. Deposit 5*l.* 5*s.* Apply at the office at the works.

TILBURY.—July 23.—For the erection of a Liberal club house in Toronto Road, Tilbury Dock, Essex. Mr. W. Krance, Dock Road, Tilbury.

TILBURY.—July 23.—For erection of additional buildings as extensions to the existing Tilbury Progressive Club. Mr. W. Krance, Dock Road, Tilbury.

TORQUAY.—July 19.—For erection of a laundry building at the Torbay Hospital. Deposit 1*l.* 1*s.* Messrs. Watson & Watson, architects, 36 Torwood Street, Torquay.

TUNBRIDGE WELLS.—July 23.—For the carrying out of all builders' work in connection with the Hurstwood Sewage Pumping station extensions (contract No. 1). Mr. W. H. Maxwell, A.M.I.C.E., borough engineer, Town Hall, Tunbridge Wells.

WALES.—July 16.—For the conversion of present premises into shop and house at Stone Street, Llandovery. Mr. Thomas Roderick, architect, Clifton Street, Aberdare; or Mr. D. Morgan, Grove House, Stone Street, Llandovery.

WALES.—July 16.—For provision of new floors to escape landings and staircase at Cardiff workhouse. Mr. Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff.

WALES.—July 16.—For erection of sixteen houses at Holly Bush, near Blackwood, Mon., for the Holly Bush Building Club. Mr. W. R. Phillips, Post Office Chambers, Pontllanfraith.

WALES.—July 19.—For building 28 houses at Ystradmynach, for the Ystradmynach Building Club. Mr. A. S. Cameron, architect, 1 Glanant Street, Aberdare.

WALES.—July 19.—For erection of new schools for 1,094 children, at Kitchener Road, Canton, Cardiff. Send 3*l.* deposit to the City Treasurer. The City Engineer's Office, City Hall, Cardiff.

WALES.—July 20.—For erection of ten houses at Gelligaer for the Cascade Building Club. Mr. William Harris, architect and surveyor, Bank Chambers, Bargoed.

WALES.—July 21.—For erection of a new mixed and infants' school at Cwmaman, near Aberdare. Mr. N. G. Lewis, architect, Abertillery. Send 2*l.* 2*s.* deposit to Mr. J. Morris, director, Education Offices, Aberdare.

WALES.—July 21.—For erection of four houses at Penygarn, Pontypool. Mr. D. C. Udell, architect and surveyor, Commercial Street, Pontypool.

WALES.—For erection of a branch bank and manager's residence at Newcastle-Emlyn, for the Metropolitan Bank of England and Wales, Ltd. Send names and 3*l.* 3*s.* deposit to Mr. C. Russell Peacock, architect, Metal Exchange, Swansea.

WALES.—July 23.—For erection of 240 dwelling-houses upon Cefn Rhychdir, New Tredegar, Mon., for Messrs. the Powell Duffryn Steam Coal Co., Ltd. Mr. George Kenshole, M.S.A., Station Road, Bargoed.

WALES.—July 27.—For additions and alterations to the Council school at Tegryn, Pembrokeshire. Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

WALSALL.—July 18.—For executing alterations and additions to the Tramway depot, Bloxwich Road, Birchills. The Borough Surveyor, Room 23, Council House, Walsall.

WEST VALE.—July 30.—For the various trades required in erection of a warehouse and stables at West Vale, Halifax. Messrs. Chas. F. L. Horsfall & Son, architects, Lord Street Chambers.

WORTH.—July 18.—For the joiner's, plasterer's, and slater's works (whole or separate), required in repairs to roof at Worth village Wesleyan chapel, Yorks. Mr. Hartley Hogarth, architect and surveyor, 43 Redcliffe Street, Keighley.

WORTLEY.—July 19.—For the re-flooring of large hall, at the Working Men's Institute, Lower Wortley, Leeds. Mr. W. Benn, secretary.

YARDLEY GOBION.—July 27.—For taking off a portion of the roof, raising the walls, and re-fixing the roof of the men's dormitory, at the Workhouse, Yardley Gobion, Northants. The Workhouse, Yardley Gobion. Mr. S. H. Hardwick, master.

THE Camberley Urban District Council last week passed plans for the erection of twenty-four new houses.

MR. W. T. LANCASHIRE, city engineer, Leeds, has been appointed building surveyor by the Leeds City Council, in succession to the late Mr. William Towers.

MESSRS. MILTON BODE and Edward Compton, the proprietors of the Northampton Opera House, have secured a freehold site in St. Giles's Street, Northampton, for the purpose of erecting a music hall.

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TENDERS.

BARNSTAPLE.

For rebuilding of business premises, High Street. Mr. SPENCER EDWARDS, architect, Barnstaple.

Bryant & Son	£792	5	0
Ridge	788	0	0
Woolaway & Son	775	0	0
Burgess & Son	766	0	0
Karslake & Son	759	0	0
Sillifant & Sons	748	0	0
CATER & SON, Barnstaple (*accepted*)	747	0	0

BRIDGEND.

For the construction and completion of sewerage and sewage disposal works for the parishes of Pyle and Tythegston Higher, for the Penybont Rural District Council. Mr. EIRYN W. DAVIES, engineer, Tondu.

Jones, Pontypridd	£23,957	0	0
Haines	16,117	0	0
Morgan	15,004	0	0
Murray	14,757	0	0
Jones, jun.	14,657	0	0
Rankin	14,650	0	0
Walker	14,320	0	0
Underwood & Bro.	14,037	0	0
Sayers	13,974	0	0
Nunn & Co.	13,822	0	0
Barnes, Chaplin & Co.	13,435	0	0
Gaylard	13,129	0	0
Smith	12,998	0	0
Hancock	12,169	0	0
Parkinson & Hodgens	10,874	0	0
W. & J. R. Watson	10,807	0	0
JOHNSON BROS., Hereford (*accepted*)	10,520	0	0

BROMLEY.

For erecting nurses' classroom and addition to drug stores at District Sick Asylum. Messrs. J. D. W. CLARKSON, architects, 136 High Street, Poplar, E.

Reason	£897	0	0
Werbking & Co., Ltd.	750	0	0
WOOLLASTON & Co., Limehouse (*accepted*)	627	0	0

CHESTERFIELD.

For erecting hunger-houses, horse-shed, &c., in the cattle market. Mr. VINCENT SMITH, borough engineer, Chesterfield.

Marsden Bros.	£681	9	3
Marriott	655	0	0
Brown	645	0	0
Holmes & Sons	600	0	0
Kirk	585	0	0
Wildgoose	575	0	0
Brailsford	562	17	0
Wright	560	0	0
Collis & Sons, Chesterfield (*recommended*)	524	0	0

DARTFORD.

For painting and repairs at Darenth Asylum. Mr. W. T. HATCH, M.Inst.C.E., M.I.Mech.E., engineer-in-chief.

Gunning & Sons	£1,480	0	0
Ellingham	850	0	0
Kazak	725	0	0
Hussey	659	0	0
Nightingale	619	0	0
Proctor & Sons	590	0	0
MILTON, Northfleet (*accepted*)	465	0	0

IRELAND.

For various drainage works within the old city areas, Dublin.

J. & T. Binns	£16,705	18	1
H. & J. Martin	15,934	0	0
MORAN & SONS (*accepted*)	14,970	9	2

For building thirty-five cottages for the Rathdown District Council, at Shankill, Co. Dublin. Mr. R. M. BUTLER, architect.

	Detached Cottage.	Semi-detached Cottage.
Dowling	£150 0 0	£147 7 6
Mosley	150 0 0	147 0 0
Bower	150 0 0	146 10 0
Monks	147 10 0	144 17 6
Pemberton & Sons		146 7 0
KINLEN, Greystones (*accepted*)*	146 0 0	140 0 0
Duncan	145 0 0	141 0 0

* 4,895*l.*, exclusive of roads, sewers, and fencing.

IRELAND—*continued.*

For the main drainage of Kilmainham district, for the Dublin Corporation.

Martin & Co.	£20,830	0	2
Moran & Sons	20,241	1	2
J. & T. Binns	16,932	16	5
H. & J. MARTIN (*accepted*)	16,082	0	0

LINCOLN.

For building a wing to the High School for Girls and for the erection of a gymnasium. Messrs. W. WATKINS & SON, architects, Lincoln.

Pumfrey	£5,441	0	0
Halkes Bros.	5,305	0	0
Pattinson & Son	5,189	0	0
Harper & Son	5,078	0	0
WRIGHT & SON, Lincoln (*accepted*)	4,826	0	0

LONDON.

For alterations and additions to 18 Great Marlborough Street, W. Mr. W. LEONARD DOWTON, architect, 1 Great James Street, Bedford Row, W.C.

Batley, Sons & Holness	£1,225	0	0
Patman & Fotheringham	1,187	0	0
Roome & Co.	1,153	0	0
Wall	1,134	0	0
Rice & Son	1,093	0	0
MATTOCK & PARSONS, Gray's Inn Road, W.C. (*accepted*)	1,078	0	0

For the execution of the wiring and the supply of fittings in connection with the installation of electric light at the following fire stations.

(1) *Woolwich Fire Station.*

Tredegar & Co.	£270	0	0
Barker & Co., Ltd.	203	13	0
Pinching & Walton	192	0	0
Newbald & Co.	186	0	0
Weston & Sons, 153 Fenchurch Street, E.C. (*recommended*)	185	0	0
Chief engineer's estimate	170	0	0

(2) *Kingsland Fire Station.*

Taylor & Co.	£221	0	0
Bryden & Sons	200	0	0
Hawkins & Sons	195	0	0
Troy & Co.	178	0	0
Fryer & Co., Bravington Works, Paddington, W. (*recommended*)	164	18	6
Chief engineer's estimate	182	0	0

(3) *Lewisham Fire Station.*

Taylor & Co.	£234	0	0
Whitehead Bros.	228	0	0
Pinching & Walton	204	0	0
Leonard & Co.	165	0	0
Tilley Bros.	160	19	0
Chief engineer's estimate	189	0	0

For the erection of 112 cottages, comprising 56 of four rooms and 56 of three rooms, on section B of the Norbury Estate.

F. & H. F. Higgs	£27,288	0	0
Akers & Co.	24,150	0	0
Wallis & Sons	22,526	0	0
Smith & Sons	22,352	0	0
Gathercole Bros.	21,816	0	0
Wall, Ltd.	21,140	0	0
F. & T. Thorne	20,767	0	0
Rowley Bros.	20,730	0	0
Fletcher	20,526	0	0
Nicholls & Son, Finchley (*recommended*)	18,765	0	0
Architect's estimate	22,658	0	0

NUNEATON.

For additions to the Free Library in Coton Road. Mr. F. C. COOK, borough surveyor.

Smith & Co.	£381	0	0
Bedingham	344	0	0
Smith	315	0	0
G. E. & W. Wincott	304	9	8
SMITH & SONS, Nuneaton (*accepted*)	297	15	0

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SCOTLAND.

For additions to the High School, North Berwick, for the School Board.

Accepted tenders.

Baillie, mason	£966 0 0
W. & J. A. Watson, joiner	924 0 0
Morton, plumber	241 11 9
Maclauchlan, plasterer	209 0 0
Anderson & Sons, slater	124 0 0

SOUTHAMPTON.

For the erection of a chapel at the Hollybrook Cemetery.

J. NICOL (*accepted*)	£2,341 0 0

For the erection of the lodge and offices at the above.

J. DOUGLAS (*accepted*)	£860 0 0

SOUTH SHIELDS.

For erecting co-operative store at the corner of Westoe Avenue and St. Vincent Street, South Shields, for the South Shields Equitable Co-operative Society, Ltd. Mr. J. ERNEST STOUT, architect, Commercial Chambers, South Shields. Quantities by the same.

Swales	£1,588 11 9
White	1,575 0 0
Jennings	1,571 8 7
Carruthers	1,561 13 11
Christie	1,557 12 4
Brown & Sons	1,550 0 0
Ridley	1,473 11 0
Sheriff & Sons	1,470 0 0
ALLISON, Whitburn (*accepted*)	1,430 0 0

SPALDING.

For erection of a girder bridge, 27-feet span, at Horseshoe Bridge, for the Trustees of the Deeping Fen drainage district. Mr. H. BAIN, engineer, King's Road, Spalding.

Thorne & Sons	£754 15 6
Goddard, Massey & Warner	750 0 0
Shanks	700 0 0
Woolston	680 0 0
Watson & Co.	620 18 4
Osgerby	620 7 0
Langley	575 3 6

Ferro-concrete.

LIVERPOOL FERRO-CONCRETE CONTRACTING Co., Bixteth Street, Liverpool (*accepted for 45-feet span*)	539 5 0
Lambrick & Co.	537 0 0

For erection of Money Bridge (45-feet span) over the River Glen, for the Deeping Fen Drainage Trust. Mr. H. BAIN, engineer, Spalding.

Thorne & Sons	£908 0 0
Goddard, Massey & Warner	904 12 0
Shanks	814 0 0
Woolston	789 0 0
Watson & Co.	703 0 0
Langley	698 6 6

Ferro-concrete.

LIVERPOOL FERRO-CONCRETE CONTRACTING Co., Exchange Chambers, Liverpool (*accepted*)	558 2 6

WALES.

For new police station at Tintern, for Monmouthshire County Council. Mr. WILLIAM TANNER, county surveyor and architect, Newport, Mon.

Hall & Harding	£1,603 0 0
Davies & Sons	1,542 0 0
Turner & Sons	1,458 0 0
Lewis & Co.	1,398 0 0
Love	1,300 0 0
Sainsbury	1,300 0 0
Griffiths	1,289 0 0
Reed	1,263 0 0
Blake	1,260 0 0
Edwards	1,260 0 0
Walters & Sons	1,247 0 0
Jones	1,246 0 0
Morgan & Co.	1,220 0 0
Leadbeter & Co.	1,220 0 0
Bendall & Son	1,215 0 0
G. F. Leadbeter	1,214 0 0
Powell & Son	1,200 0 0
Williams	1,179 0 0
Charles	1,175 0 0
Prosser	1,160 0 0
Moon, Newport (*accepted*)	1,150 0 0

WALES—*continued.*

For erecting thirty-three cottages at Cwmellyn, Blaina, for Blaina Central Building Club. Messrs. LEWIS & DAVIES, architects, Merthyr and Blaina.

Tudor	£8,075 10 0
Gay & Head	7,922 4 0
T. W. & J. JENKINS, Penydarren, Merthyr (*accepted*)	7,524 0 0

For erection of new mixed and infants' school at Tyr Graig, Aberbeeg. Messrs. SPEIR & BEAVAN, architects and surveyors, Cardiff.

Shail	£14,800 0 0
Lewis	14,400 0 0
Howells	14,004 10 0
Turner & Sons	13,924 0 0
Davies & Sons	13,878 0 0
Thomas	13,870 12 2
Jenkins, Ltd.	13,570 0 0
DAVIES & HOWELL, Cardiff (*accepted*)	13,469 0 0

WEREHAM.

For building small house and farm buildings.

Johnson & Son	£530 0 0
Eggett & Flotman	518 10 4
Collins	499 0 0
ASHBY, Downham Market (*accepted*)	435 0 0

WEYMOUTH.

For erection of a new school at Melcombe Regis.

Whettam, jun.	£4,363 0 0
Fursland	4,357 9 0
Lovatt	3,785 0 0
Conway	3,724 16 5
Trask & Son	3,591 10 0
Green	3,472 0 0
Bowman & Sons	3,469 8 0
Playfair & Toole	3,423 0 0
Woot & Way	3,336 8 1
Pittard & Son	3,280 0 0
Jenkins & Sons	3,259 0 0
Moore & Sons	3,159 15 0
Wakeham Bros.	3,072 0 0
Jesty & Baker (*recommended*)	3,067 15 4

WINDSOR.

For alterations and additions to the boys' and girls' schools in the Bachelor's Acre, for the Windsor Royal Free Schools. Messrs. EDGINGTON & SPINK, architects, Windsor.

Godwin	£1,795 0 0
Beauchamp	1,467 0 0
Bowyer	1,398 0 0
Burfoot & Son	1,375 0 0
Gibson & Sons	1,364 0 0
Burfoot & Butler	1,360 0 0
Brown	1,273 0 0
Roberts	1,198 0 0
Love	1,195 0 0
HENDRY, Windsor (*accepted*)	1,150 0 0

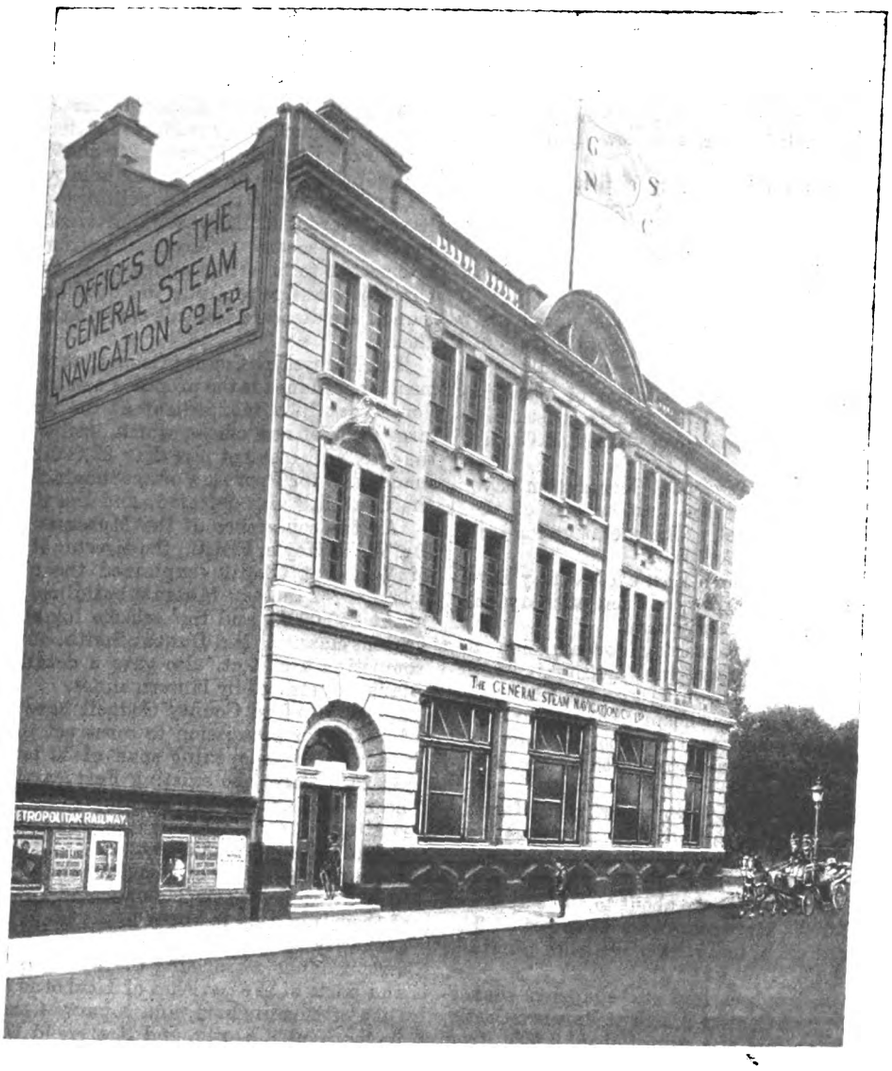
WINSFORD (CHESHIRE).

For erection of Council school buildings at Meadow Bank, Winsford.

Newall	£5,250 0 0
Finney	4,315 0 0
Sergeant Bros.	4,295 0 0
Wilson	4,250 0 0
Dickenson & Noden	3,985 0 0
Fowles & Sons	3,900 0 0
CURZON (*accepted*)	3,484 0 0

THE foundation-stone of a new church on the "Heights," Caversham, was laid recently. The church will consist of chancel, vestries, nave, north and south aisles, and will provide accommodation for about 300, with choir stalls for thirty. It has been so proportioned that it can be extended to the west to accommodate another 200. Space has also been left on the south aisle of the chancel for a Lady chapel. The general design is Perpendicular. The church was originally designed with an octagonal east end, but this was altered to a square east end in accordance with the suggestion of the Incorporated Church Building Society. The cost will be about 5,200*l*. Messrs. Wheeler Bros., Caversham, are the contractors. The designs have been prepared jointly by Mr. James Haslam, M.S.A., and Mr. Ernest Ravenscroft.

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Messrs. E. I'ANSON & SON, Architects.

CORRESPONDENCE.

SIR,—We beg to advise you that the style of our firm has been changed from Garston Frères to Garston, Limited, and all communications should now be addressed to Garston, Limited, at this address.—We are, yours faithfully,

10 Adam Street, Adelphi, W.C. GARSTON, LIMITED.
July 1910.

COMPETITION.

THE Pontefract Education Committee on Tuesday considered the award of Mr. Sydney D. Kitson, of Leeds, the assessor appointed to adjudicate upon the nineteen sets of competitive plans sent in by Yorkshire architects for the proposed elementary school for Pontefract borough, to accommodate 750 children, at an estimated cost of 9,000*l*. The committee accepted the award, which was found to be as follows:—(1) Messrs. Tennant & Collins, Pontefract; (2) Mr. James Forbes, Middlesbrough; (3) Messrs. W. H. Thorpe & Son, Leeds.

TRADE NOTES.

THE address of the Peerless Heater Company, whose apparatus we described in our issue of July 8, is 70 & 71 Bishopsgate Street Within, London, E.C.

THE Superior Jury of the Japan-British Exhibition, London, 1910, have given the highest award in its class (the gold medal) to the Saxon Portland Cement Company, Ltd., Cambridge, for their exhibits relating to the manufacture, testing and uses of Saxon Brand Portland cement, which are to be found in Building 48, space No. 235.

MR. THOMAS CROMPTON, the well-known Lancashire manufacturer of hinges and locks, of Ashton-in-Makersfield, near Wigan, died last week in his 81st year. He was the doyen of British hinge makers, and Crompton's hinges have secured a well-deserved popularity throughout the world for good workmanship. To the last Mr. Crompton was enabled to give personal attention to his business, and has passed away regretted by all who had the pleasure of his acquaintance.

OWING to the increase in their business as lift manufacturers, Messrs. Smith, Major & Stevens, Ltd., have for some time past found their Battersea premises inadequate for their growing needs, and have been compelled to provide new works which are now in course of erection at Northampton. A spacious plot of land has been secured affording ample opportunity for further expansion, and it is intended that the new premises shall embody not only the most modern manufacturing improvements, but shall provide also for the greater comfort and health of the workmen and staff. It is hoped that the new works will be ready for occupation in the autumn. A portion of the staff and a number of workmen will be retained in London in the interests of the extensive connection possessed by the Company in the Metropolitan district, where they and their predecessors have been established for 140 years.

"DECONVERRE" is, as explained in our issue of July 1, a new form of glass decoration by which all the effects of leaded lights or stained-glass windows are obtained. Messrs. Wotton & Sons, Croydon, the manufacturers, wish to emphasise the fact that "Deconverre" is not an imitation of either of these. It is an independent method of arriving at a kind of decoration which has hitherto been limited to stained and leaded glass, and which was for that very reason restricted in its use. The usefulness of "Deconverre" lies in the fact that it opens up a new vista of decorative possibilities which is closed to the older methods of ornamenting glass

THE London, Tilbury and Southend Railway Co. have decided to name their new station, situated between Southend and Shoeburyness, Thorpe Bay.

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VARIETIES.

A SCHEME of extension of the Perth County Fever Hospital at Burghmuir, Perth, is under consideration. The County Medical Officer recommends the erection of composite wood and iron buildings at a cost of 2,500*l.*

MR. THOMAS BARTLETT, a Liverpool estate agent, has undertaken to provide a peal of bells for the new Liverpool Cathedral.

THE Berks County Education Authority advertise their intention to provide a new public elementary school for about 220 children in the parish of Thatcham.

MR. J. W. FISHER, of Wellingborough, has been appointed diocesan surveyor for the Northampton archdeaconry in place of the late Mr. M. H. Holding.

MR. HENRY JAMES WISE, A.R.I.B.A., has removed his office from Great James Street, W.C., to 64 South Molton Street, W., where his telephone number is Mayfair 4331.

THE South-Eastern District of the Institution of Municipal Engineers have re-elected Mr. Henry C. Adams, consulting municipal engineer, of 60 Queen Victoria Street, E.C., as chairman.

THE Estates Committee of the Liverpool Corporation have approved the plans submitted for the first section of the Adelphi Hotel Extension, Liverpool. The architect for this important scheme is Mr. R. Frank Atkinson.

THE board of directors of the North-Eastern Railway have approved of designs for a new railway station at Blaydon. The work will be commenced at an early date.

THE Sheffield Corporation are asking for sanction to borrow 7,920*l.* for works of sewerage, and an inquiry into the application will be held at the town hall on the 19th inst.

THE foundation-stone of a new eye hospital at the junction of Oldhall and King Edward Streets, Liverpool, is to be laid on the 20th inst. The plans have been prepared by Mr. John Clarke, F.R.I.B.A.

GREENOCK Dean of Guild Court have passed plans for the erection of eight self-contained cottages at Fort Matilda Place, a new street recently opened by Sir Hugh Shaw Stewart near the torpedo factory.

THE Warrington Town Council are about to make application for a loan of 23,000*l.* for waterworks purposes. The scheme includes a new 18-inch. main from Winwick pumping station to Sankey Street.

THE foundation-stone has been laid of a chapel in connection with the North-Eastern County School at Barnard Castle, Durham, which is to be erected at a cost of about 3,000*l.* from the designs of Mr. W. D. Caröe.

THE foundation-stone of St. Gabriel's Church, Kayll Road, Bishopwearmouth, Sunderland, was laid on the 7th inst. The work is to be carried out in four sections, the first of which will cost 9,800*l.*, and the remaining three an additional 2,800*l.* The plan of the church is cruciform, with shallow transepts, one of which will be used as the morning chapel when required. The church has seating accommodation for over 800 persons. A large hall, divided into class-rooms, is placed beneath the east end of the church. The tower is placed over the crossing. The work is being executed by Mr. W. D. Allison, contractor, Whitburn, from plans by Mr. Clayton Greene, of Sunderland.

MESSRS. HAIGH & THOMPSON, architects, Liverpool, have prepared plans, which were adopted by the vestry on the 12th inst., for alterations at the hospital at Brownlow Hill Workhouse. The cost will probably be about 5,000*l.*

THE trustees of Heriot's School, Edinburgh, are considering a scheme for the provision of additional science class-rooms. The superintendent of works has prepared a scheme estimated to cost 9,000*l.*, exclusive of fittings.

A SCHEME for alterations and additions to the Chichester and West Sussex Infirmary buildings at Chichester is proposed to be carried out as a memorial to King Edward VII. at a cost of between 20,000*l.* and 24,000*l.* Towards this amount a promise of a donation of 10,000*l.* has been received.

PLANS have been prepared and approved for the erection of a new covered stand at Powderhall Grounds, Edinburgh, the headquarters of Scottish pedestrianism and dog-racing. It is the intention of Mr. F. A. Lumley, the lessee, to carry out a number of alterations.

THE Roman Catholic Bishop of Liverpool on Sunday laid the foundation-stone of the new church of St. Thomas of Canterbury at Windleshaw, St. Helens. The church will have accommodation for 450 people, and will take the place of a school chapel, built in 1892, which has become too small for the congregation.

A NEW variety theatre is shortly to be erected in the East End of Glasgow. The new hall will be built at the north-east corner of Charles Street and Orr Street, Bridgeton Cross. The nominal capital of the company is to be 40,000*l.* Provost M'Millan, Greenock, will be chairman. The architects will be Messrs. Fred Matcham & Co.

BATHALA—one of the most impressive edifices in the world—is described in an article on "A Portuguese Pilgrimage," appearing in *Harper's Magazine* for July, which also contains among much other readable matter essays on "A Group of Modern English Painters," and "Some Votaries of Bruges," the whole of which are admirably illustrated.

THE Sevenoaks Urban Council have received a report from Messrs. Mordey & Dawbarn, electrical engineers, advising them that a scheme of electric lighting for that town might be expected to be self-supporting in the third year, and to show a progressive profit up to 1,300*l.* by the tenth year. The Council are disposed towards carrying out an electric lighting scheme.

THE Derbyshire County Council at their quarterly meeting considered plans for the proposed new county offices. A resolution "that it is inexpedient at the present time to erect a large block of new offices, which, exclusive of 8,000*l.* paid for the site, will cost not less than 22,000*l.*, and which would be inadequate for Poor Law offices should that work devolve upon the Council," was defeated, and the plans were adopted.

AT the conference of the Museums Association at York, Dr. W. E. Hoyle, F.R.S., the director of the National Museum of Wales at Cardiff, explained the plans which had been adopted for the new Museum buildings at Cardiff at a cost of about 250,000*l.*, and the scheme for allotting space to the various classes. Mr. Dunbar Smith, of London, the successful competing architect, also gave a detailed description of the plans, illustrated by lantern slides.

THE Wexford County Council have applied to the Board of Trade for permission to construct in ferro-concrete a new bridge, with an opening span of 30 feet clear, alongside of, and to replace, the existing Ferrycarrig wooden bridge over the river Slaney. The opening span of the new bridge will be situated near its northern end, and the clear headway thereof will be about 8 feet.

THE Corporation of Birmingham have given formal notice, in accordance with the Housing and Town-Planning Act, 1909, of their intention to apply to the Local Government Board for authority to prepare a town-planning scheme in relation to certain lands comprising the whole of the parish of Quinton and parts of the parishes of Harborne and Edgbaston, in the City of Birmingham, and a part of the parish of Northfield in the King's Norton and Northfield Urban District.

H.M. VICE-CONSUL at Adana reports that the Government of Turkey have a scheme on hand for the erection of 250 houses there, and it is probable that work will be begun this summer. Besides this a large orphanage is to be built, at a cost of from 7,200*l.* to 9,000*l.*, to accommodate 500 orphans. Barracks are also needed, and a new building to replace that of the Courts of Justice recently burnt down. The total expenditure for all the above would be not less than 90,000*l.*

THE following plans have been passed by the sub-committee on plans of houses and buildings of the Lower Ward of Lanark:—Mr. W. C. Stirling Stuart, for erection of dwelling-house at Muirside Farm, Carmunnock; Messrs. J. Nimmo & Co., Ltd., for office buildings at Auchingeich by Chryston; Mr. R. Milligan, for alteration of double cottage on Cumbernauld Road, Mollinsburn; and Mr. R. Provan, for villa south of Cathcart Road, Westfield, Rutherglen.

THE Aberdeen Town Council have appointed Mr. G. N. Yourdi, B.A. (Dublin), M.Inst.C.E., and Mr. William Fox, M.Inst.C.E., London, to advise the committee as to a scheme for a supply of water from the Dee at or above Cairnton, the scheme to include the construction of works capable of providing a supply as a first instalment to the amount of 10,000,000 or 12,000,000 gallons per day; and, second, an instalment to the amount of 20,000,000 gallons per day. The names of several independent engineers, in addition to the above, were submitted by Mr. James C. Inglis, the president of the Institution of Civil Engineers.

THE West Riding County Council are applying for a number of loans for various purposes, and these include 4,358*l.* for the erection of a school at Stannington; 2,322*l.* for a school for Denby and Cumberworth; 3,658*l.* for a new mixed department at Wath Victoria Road school; 2,602*l.* for an infants' department at Park Road school, Wath; 2,860*l.* (in addition to 10,500*l.* sanctioned in May 1907) for Barnsley Grammar school; 2,000*l.* (in addition to 18,672*l.* sanctioned in October 1907) for Barnsley High School for Girls.

AT Paisley Dean of Guild Court the following plans were passed:—Mr. Clark Hunter, Paisley, to erect eight semi-detached villas in North Greenhill Road, Paisley; Archbishop Maguire and others of the Finance Board of the

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Catholic Archdiocese of Glasgow, to erect a new school in Queen Street, Paisley; trustees for the United Free Presbytery of Paisley, to erect a new church in connection with the Ralston congregation; Mrs. Margaret Hedderwick, residing at Hillhead Road, Crookston, to erect a cottage in Alton Road.

THE Tottenham Education Committee were recently informed that 1,562*l.* would be deducted from the grants because of the overcrowded condition of the schools. The President of the Board of Education has since promised to remit half of the fine when a tender for a new school at Culvert Road is accepted, half of the remainder when a tender for another school in a different part of the district is accepted, and the rest at the end of next year if it can be shown that the schools are not overcrowded.

To enable those who wish to get away from the routine and associations of city life for a day or week-end in the healthy and picturesque country around the Chiltern Hills and Vale of Aylesbury, cheap tickets are issued from Marylebone four days a week to Amersham, Aylesbury, Chalfont Road, Chesham, Chorley Wood, Great Missenden, Stoke Mandeville and Wendover, and for two days a week to many other stations in this delightful district. This country of fine and lucid air, of undulating hill and valley, has a quiet charm all its own. A postcard to Publicity Department, 216 Marylebone Road, N.W., will bring you an A.B.C. programme giving full particulars.

THE Guild of Architects' Assistants, by permission of the architects, Messrs. Lanchester & Rickards, paid a visit to the Wesleyan Centenary Hall at Westminster on the 9th inst. Mr. E. C. Howell, the clerk of works, and Mr. Elliott, who represented Messrs. Dove Bros., the contractors, conducted the party over the works and gave detailed information concerning the reinforced concrete and the general construction of the building. The stonework, its mouldings, and carvings were much admired, while the probable omission of the fine towers on the main front, due to a question of light with the Westminster Hospital, was greatly deplored. The great hall, with its balconies and seating tiers in reinforced concrete and hollow brick, caused particular interest on account of its novel and ingenious planning.

AT a meeting of King's Norton Urban District Council at Selly Oak the Council adopted a recommendation to build a set of baths at King's Heath, consisting of a large and a small swimming bath, first and second class slipper baths, and Russian baths, at a cost of 12,000*l.* The site is in Institute Road. It was also agreed to spend 400*l.* in the provision of a lodge for King's Heath Park. The education committee reported that notices had been issued of their intention to provide an elementary school in Selly Oak Road to accommodate 1,200 scholars. The finance committee have made arrangements to borrow 50,138*l.* from the Ecclesiastical Commissioners at 3¾ per cent. for providing new schools, furniture and fittings.

AT a general meeting of the York Master Builders' and Contractors' Association, presided over by the Lord Mayor of York (Alderman Jas. Birch), it was resolved, after full and prolonged discussion, that owing to the heavy increase in rate of premiums payable by the building and allied trades for the insurance of workmen the prices charged in respect of work done by the skilled workmen engaged in the various trades shall be increased by the sum of one farthing per hour. It is understood that the ordinary rates for builders have been increased from 20*s.* to 50*s.* per cent., according to height; wood-working machinists from 2*l.* to 4*l.* 10*s.* per cent.; demolition work and tower and steeple work to 10*l.* per cent.; slaters and tilers from 35*s.* to 50*s.* per cent.; plumbers from 20*s.* to 5*l.*, including well risks over 20 feet in depth, and to 50*s.* per cent. for depths not exceeding 20 feet in depth.

THE housing of the working classes committee of the London County Council recommended that the tender of Messrs. Rowley Bros. for the erection of eighty-two additional cottages on the third part of section C of the Totterdown Fields estate, amounting to 15,828*l.*, be accepted. The Council has on previous occasions agreed to supply to contractors for use in the erection of cottages on this estate, bricks manufactured on the Norbury estate. In the event of the Council supplying certain of the bricks required, Messrs. Rowley Bros. are willing to allow 26*s.* per 1,000 for stock facings and 22*s.* per 1,000 for general walling bricks. The cost to the Council of the 500,000 bricks which it is proposed to supply to the contractors, inclusive of interest up to March 31, 1910, amounts to 1,100*l.*, and the amount to be allowed by the contractors in respect thereof, to 573*l.* The difference, amounting to 527*l.*, will be charged to the account of the dwellings on the Norbury estate.

MR. THOMAS ROSS, F.S.A., architect, Edinburgh, received last week the degree of Doctor of Laws from the University of Edinburgh, when the following address was made:—Scotland is especially beholden to this distinguished representative of scientific archæology, for it may be claimed for him and his fellow-worker, the late Mr. MacGibbon, that they have added a chapter to the history of Scottish civilisation which but for their efforts might have remained unwritten. For years Mr. Ross, in conjunction with Mr. MacGibbon, devoted himself to investigating the ancient structures which are scattered over the country, with a view to tracing systematically the evolution of the national architecture through its successive stages. The first-fruits of this assiduous toil were the monumental volumes with the title "The Castellated and Domestic Architecture of Scotland." The work so described is one of great originality, being indeed the first attempt to apply scientific treatment to the subject handled, and it is one of the highest value from the historical point of view. Moreover, it may be claimed for it that it has exercised a beneficial influence in the way of inducing proprietors to take steps in arrest of the dilapidation of venerable buildings in their possession. Subsequently the joint authors published an equally massive treatise on the "Ecclesiastical Architecture of Scotland," which is recognised as the standard authority on the subject. Not the least important feature of these two colossal undertakings is their wealth of illustrations and plans, and these were entirely the handiwork of Mr. Ross. Whenever a Roman site or other spot of antiquarian interest has to be excavated, and measurements and plans drawn out, Mr. Ross's services are always in requisition, and are always ungrudgingly given. His contributions to archæological science are pre-eminently deserving of the degree.

WHITE HART LANE ESTATE DEVELOPMENT.

THE Housing of the Working Classes Committee of the London County Council have under consideration the question of dealing with the undeveloped portion of the White Hart Lane estate, Tottenham, which was acquired by the Council for the provision of dwellings for the working classes under Part III. of the Housing of the Working Classes Act, 1890. The estate is situated in a district where the working-class population already largely predominates, and they think it would be to the advantage of the district generally if a substantial proportion of better-class property could be erected on the land. Among other proposals which they propose to submit to the Council for dealing with this estate is one that a portion of the land not yet built upon should be leased for development on the lines of the Hampstead garden suburb, which comprises many different types of houses, including small cottages at a moderate rental and several grades of villa residences suitable for middle-class occupation.

The provisions of the Housing Acts, however, do not permit of the erection of dwellings for any other than the working classes on land which the Council holds under Part III. of the Act of 1890, and the committee suggest, therefore, that legislation should be promoted in the next session of Parliament to enable the Council to lease any part of the estate for development on the lines indicated.

The solicitor has advised that the Council has power to promote such legislation and that it will be necessary to proceed under the provisions of the Borough Funds Act, 1872, as applied by the County Councils (Bills in Parliament) Act, 1903. Ten clear days' notice will therefore have to be given by public advertisement that the question of promoting legislation will be considered by the Council at a meeting to be held on a specified date, which they suggest should be July 26, 1910. It will then be necessary for the Council, should it desire to proceed with the proposal, to pass a resolution to promote the legislation and to defray the costs of so doing out of the county fund. Such resolution must be passed by an absolute majority of the whole number of the Council, and subsequently the Council will have to obtain the approval of the Local Government Board to the course of action proposed to be taken. If the recommendation be adopted they propose to submit to the Council on the day above-named a recommendation to give effect to the proposal, and they will at the same time submit further particulars of the policy to be pursued with regard to land which the Council has acquired for housing purposes but has not yet utilised. They recommend:—"That notice be given by public advertisement of the intention of the Council to consider, at its meeting on July 26, 1910, a proposal that it shall take the necessary measures for promoting in the session of Parliament of 1911 legislation relative to the development of the White Hart Lane estate, and to defray out of the county fund the cost and expenses of so doing."

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WOOD BLOCK FLOORING CONTRACT.

THE London County Council at the end of last year decided to give notice to the Zeta Wood Flooring Company, Ltd., for the termination of their contract for providing and laying wood block flooring in Council schools. New tenders, which were invited by public advertisement, were received from the undermentioned eleven firms, the prices quoted for the floor which is commonly specified, viz., 12 inches by 3 inches by 1½ inches pitch pine blocks, being as follows:—

Name and Address of Contractor.	Price per Yard Super for 12 in. by 3 in. by 1½ in. Pitch Pine Blocks. s. d.	Description of Blocks.
Hollis Bros. & Co., 101 Hatton Garden	5 4	Grooved and tongued.
Complete Wood Flooring Co., Ltd., Euston Square	5 5	Grooved and tongued or dowelled.
Acme Flooring and Paving Co. (1904), Ltd., Gainsborough Road, Victoria Park (a)	5 6	Grooved and tongued, Rio quality.
(b)	5 9	Dowelled, Rio quality.
(c)	6 6	Dowelled, specially selected material.
E. Burgess & Co., 6 Castle Street, Liverpool	5 8	Grooved and tongued.
"Zeta" Wood Flooring Co., Jupp Road, Stratford	5 11	Dowelled.
Ellis, Geary & Co., 50 Cannon Street	6 0	No samples.
Westminster Patent Flooring Co., Heckfield Place, Walham Green	6 0	Metal discs to joints.
Turpin's Parquet Floor, Joinery and Wood Carving Co., Queen's Road, Bayswater	6 3	Grooved and tongued.
"Excellence" Wood Block Flooring Co., Ltd., 7 Sheaf Street, Leeds	6 6	No samples.
R. M. Weaver, Dunstable Road, Wolverhampton	6 9½	Grooved for mastic only.
Improved Wood Pavement Co., Ltd., 46 Queen Victoria Street	7 0	No samples.

The tenders and samples have been examined, but as there are a number of schools which require to be dealt with as soon as possible, the education committee are of opinion that, pending a final decision as to the tender which should be accepted, the work at two schools should be entrusted to Messrs. Hollis Bros. & Co., and that the work at ten schools should be entrusted to the Acme Flooring and Paving Company (1904), Ltd. The committee recommend:—"That, as a matter of urgency, wood-block flooring work at two London County Council schools be carried out by Hollis Bros. & Co., at the prices quoted in their tender dated May 2, 1910, for grooved and tongued blocks, and at ten London County Council schools by the Acme Flooring and Paving Company (1904), Ltd., at the prices quoted in their tender, dated May 3, 1910, for Rio quality dowelled blocks; that the solicitor do prepare, and obtain execution of, the necessary contracts; and that the clerk of the Council do sign each such contract when ready."

L.C.C. TRADE SCHOLARSHIPS.

THE London County Council on December 17, 1907, decided to award annually twenty trade scholarships tenable at the L.C.C. School of Building (Brixton) on the same conditions as the trade scholarships tenable at the L.C.C. Shoreditch Technical Institute (Hoxton). The regulations for these latter awards provide for their tenure for two years in all cases, and for a further year's extension in the cases of those scholars who are less than sixteen years of age on July 31 at the end of the second year of the award. The scholarships tenable at the L.C.C. School of Building were first awarded as from August 1, 1908, so that in the ordinary course certain of the awards would lapse on July 31, 1910, after a period of tenure of two years. It appears, however, that, although it was expressly stated in the letter of award that the scholarships were only tenable for two years except in the special cases referred to above, all the scholars have been acting on the assumption that the awards would in every case be extended for a third year. The principal of the school, moreover, has apparently been under the impression that the awards would be extended for a third year, presumably in view of the fact that the scheme of work at the trade school provides for a three years' course. There are five scholars whose awards would in the ordinary course lapse on July 31, but in that event it would seem that the value of their scholarships would be lost to a large extent as their course of study would be cut short prematurely, and as they would be forced to find employment which might be of an unsatisfactory character owing to their insufficient training. The Education Committee are therefore of opinion that the scholarships at the L.C.C. School of Building should in all cases be tenable for a period of three years. This change would, however, involve an alteration in the age of eligibility of candidates for these awards. The existing regulations provide that the competitors should be not less than thirteen and less than sixteen years of age on July 31 in the year of the award. They think, however, that the upper age limit should be fixed at fifteen years of age, so that scholars would be enabled to start work in the trade at the age of 17+. In order that no hardship may be placed upon prospective candidates competing in the year 1911, it would not be advisable to bring about the change as to age until August 1911, to take effect in the first instance in the 1912 award. It will not be necessary for any change to be made in the amount of the maintenance grants attached to the awards, which are 6*l*. for the first year, 10*l*. for the second year, and 15*l*. for the third year, if extended. The increased cost of the scholarships, as tenable for three years, is small. During the financial year 1910-11 the extra cost will be about 25*l*. The maximum increased cost, which will not be reached until 1912-13, will be 75*l*. a year. The maintenance estimates of the school have always been based on a three years' course for each pupil in accordance with the terms of the prospectus of the day trade school. No increased cost will therefore occur under that head. Subject to the approval of their proposals, the Education Committee have extended for one year the period of the tenure of the scholarships of the five scholars whose awards lapse on July 31, 1910, and of the six scholars whose awards lapse on July 31, 1911.

The Education Committee report also that they have had under consideration the question whether trade scholars should be regarded as eligible to compete for pupil teacherships of handicraft, in view of the fact that the Council's object in establishing trade scholarships was to train boys to become skilled artisans, not to become teachers. The trade scholarships in furniture and cabinet making are held at the L.C.C. Shoreditch Technical Institute, and during the two years during which the scholars attend the Institute they are kept under careful observation; some of them prove to be of superior merit, and it is felt that they are the exact type of boy to be trained as instructors of handicraft. In the committee's opinion it would be a hardship for such boys to be regarded as ineligible for the competition for pupil-teacherships of handicraft. It is true that as a condition of the award of their trade scholarships their parents have signed a bond that they will enter the trade for which they have been trained. On the other hand instructors in handicraft hold a different position from ordinary teachers, and have usually been drawn from the ranks of skilled artisans. In all the circumstances the Education Committee are of opinion that trade scholars should be allowed, on the lapse of their trade scholarships, to compete for pupil-teacherships of handicraft, if otherwise eligible. Subject to approval they have awarded pupil-teacherships of handicraft to four trade scholars.

A NEW school is to be built on the site of the temporary school near the railway station at Giffnock, N.B.

MR. ERNEST WHALEY, of St. Ives, Hunts., has been appointed highway surveyor for Cookham.

THE old library buildings in Hamilton Street, Birkenhead, are to be acquired for the purposes of a public art gallery and museum.

THE Lostwithiel Town Council have carried a resolution that a town hall and municipal buildings should be erected on the site of the old grammar school.

THE Windsor Place Presbyterian Church, Cardiff, is to be rebuilt on the exact lines of the fabric destroyed by fire in February. A premium for 9,300*l*. has been received from the insurance company.

THE West Bar (Leeds) Estate Company, Ltd., has been registered as a private undertaking, with a capital of 50,000*l*. in 100*l*. shares, to acquire land, house, shop, warehouse, and other property in Leeds or within seven miles thereof. The first directors are Mr. T. H. Nussey and Sir Thomas Willans Nussey, M.P.

THE Archbishop of York last week laid the first stone of the nave of St. Luke's Church, Burton Stone Lane, York. The erection of the edifice was commenced in 1900. The chancel, vestries, and Sunday schools were then carried out. The nave, two aisles, and the organ chamber, which remain to be added to complete the church, are to cost 4,000*l*. Mr. W. H. Brierley is the architect.

THE Local Government Board have intimated to the Worcester City Council their unwillingness to sanction a further loan of 10,000*l*. for the deep-level sewer scheme to get the city sewage to the disposal works at Bromwich Lane. If they persist in their refusal the Council will have to revert to the proposed screens on the east side of the Severn at Diglis, against which inhabitants of the district have already entered an emphatic protest.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

BELFAST.—Sept. 5.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

GORLESTON-ON-SEA.—August 31.—The Governors of the East Anglian Institution for Blind and Deaf Children invite plans and designs for a new building to be erected at Gorleston-on-Sea. The competition will be confined to architects having an office or residing in the areas of the following education authorities:—Cambridgeshire, Isle of Ely, Lowestoft, Norfolk, Norwich, East Suffolk, and Great Yarmouth. Copies of the instructions to architects within the prescribed areas will be sent on a remittance for 10*s.* (returnable). Documents to be sent back. Mr. D. O. Holme, clerk of the governors, Castle Chambers, Norwich.

IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

IRELAND.—Sept. 1.—The Kingstown Urban Council offer prizes of 50*l.* and 20*l.* for the best sets of plans for a Carnegie Library to be erected in Lower George's Street. Deposit 1*l.* 1*s.* Mr. J. Sherlock Vaughan, town clerk, Town Hall, Kingstown.

SCOTLAND.—The committee of Buckhaven Co-operative Society, Ltd., is prepared to receive competitive plans for proposed extension to bakery premises. Full particulars may be had from the Manager, Randolph Street, Buckhaven.

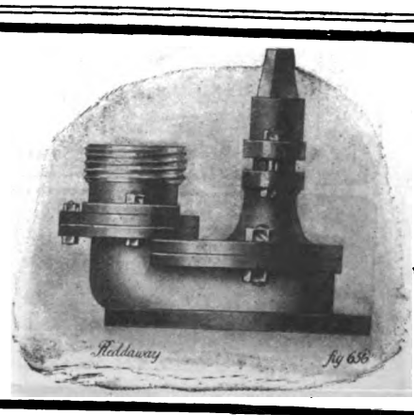
Two bills have been submitted to the Uruguayan legislature, one authorising the executive authorities to expend 53,100*l.* for the construction of a bridge across the river Queguay, in the Department of Paysandú, and the other earmarking a similar amount for the erection of post and telegraph buildings.



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CONTRACTS OPEN.

ALFORD.—July 27.—For erection of headquarters at Alford, for the Lincolnshire Territorial Association. Mr. R. H. Fowler, architect, Louth.

ASHTON-UNDER-LYNE.—July 25.—For the works required in erection of the new savings bank. Messrs. W. H. George & Sons, architects, 7 Warrington Street, Ashton-under-Lyne.

BELFAST.—July 25.—For building a warehouse in Bedford Street. Deposit 2*l.* 2*s.* Messrs. Watt, Tulloch, & Fitzsimons, architects, 77A Victoria Street, Belfast.

BOURNEMOUTH.—Aug. 4.—For alterations to the Head Post Office, Bournemouth, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Secretary, H.M. Office of Works, &c., Storey's Gate, London.

CHATHAM.—July 23.—For erection of a receiving ward and two pairs of cottages at the Cottage Homes, Chatham, for the Guardians of the Medway Union. Mr. G. E. Bond, architect, 384 High Street, Rochester.

CRICKHOWELL.—For the erection of new garage, &c., for Mr. R. H. A. Davies, Crickhowell. Mr. E. A. Johnson, F.R.I.B.A., architect, Abergavenny.

DOUGLAS.—July 29.—For erection of retort-house roof and coal-store roof, retort stack, and retort-stack mountings at the Gasworks, Douglas. Deposit 1*l.* 1*s.*, returnable. Tenders to Mr. Charles H. Kay, secretary, Gas Offices, Douglas.

DROXFORD.—Aug. 8.—For painting and general repairs to the buildings at the workhouse, for the Guardians of Droxford Union. Mr. H. Godfrey Pearson, clerk, Bishop's Waltham.

DURHAM.—July 26.—For the erection of a district church at Usher Moor, near Durham. Mr. G. Hodgson Fowler, F.S.A., architect, The College, Durham.

FERRYHILL (DURHAM).—For new branch store at Ferryhill, for the West Cornforth Industrial Co-operative Society, Ltd. Mr. J. W. Bell, architect, 16 Feversham Terrace, Ferryhill.

FLIMBY.—July 25.—For the various works required in erection of ten cottages at Flimby, Cumberland. The Maryport Co-operative Industrial Society, Ltd., Central Stores, Maryport, also Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

GARFORTH.—For asphalting playgrounds at the Garforth Council school. Mr. Robert J. Smith, Education Offices, Garforth, near Leeds.

GLASGOW.—July 25.—For the erection of the concert hall at the Scottish Exhibition of National History, Art, and Industry, 1911. Deposit 3*l.* 3*s.* with the Secretary, 190 West George Street. Messrs. Walker & Ramsay, architects, 108 Douglas Street, Glasgow.

GLASGOW.—July 26.—For supplying and laying the copper roof at Glasgow Cathedral, for the Commissioners of H.M. Works and Public Buildings. The Clerk of Works at the Cathedral. Send 1*l.* 1*s.* deposit to H.M. Office of Works, 3 Parliament Square, Edinburgh.

HALIFAX.—Aug. 1.—For the various works required in connection with the erection of an arcade, billiard hall and appurtenances on the Wards End Estate, Halifax. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

HASTINGS.—Aug. 3.—For the erection of covered shelters at the Hastings Workhouse Infirmary, for the Guardians. Messrs. A. W. Jeffery & Son, architects, Havelock Road, Hastings. Mr. A. R. Inskipp, clerk, 11 Wellington Square, Hastings.

HAYDON BRIDGE.—Aug. 3.—For the work of remodelling Haydon Bridge Shaftoe Trust school. Send names by July 20 with 2*l.* 2*s.* deposit to Mr. Edwarl Davidson, clerk to the governors, Estate Office, Haydon Bridge.

HAYWARDS HEATH.—July 29.—For repairs, painting, and other works to buildings on the estate of the Brighton County Borough Asylum. Mr. J. G. Gibbins, F.R.I.B.A., surveyor to the Asylum, 3 Palace Place, Brighton.

HEMEL HEMPSTED.—July 26.—For repairs and decorations at Boxmoor Hall, for the Town Council. Mr. Walter R. Locke, borough engineer, Town Hall, Hemel Hempsted.

IRELAND.—July 26.—For painting the town hall, for the Enniskillen Urban District Council. Mr. Thomas Elliott, borough surveyor.

KINGSTON-UPON THAMES.—July 25.—For alterations and additions to the workhouse buildings at Norbiton Common Farm, Kingston Road, New Malden, for the Guardians of Kingston Union. Mr. Chas. W. Dash, clerk, Union Offices, Kingston-on-Thames.

KNOTTINGLEY.—July 29.—For the asphalting of the Beal Council school playgrounds. Mr. Charles Harris, Education Offices, Knottingley.

LEEDS.—July 28.—For the several works required in connection with a weaving shed at Pudsey. Messrs. C. S. Nelson & G. Birkenshaw, architects, Sun Buildings, 15 Park Row, Leeds.

LONDON.—July 27.—For pulling down a portion of 160 King Street, Hammersmith, and erecting a new shop front, &c., on the line of the street improvement, for the Borough Council. Mr. H. Mair, borough surveyor, Town Hall, Hammersmith.

LONDON.—July 28.—For the construction of exit iron staircases and the necessary structural alterations in connection therewith at the St. George's Workhouse, Mint Street, Borough, S.E. Deposit 1*l.* 1*s.* Mr. A. J. Wade, architect, 104 Harvist Road, Brondesbury, N.W.

LONDON.—July 28.—For the erection of South Lambeth Sorting Office, for the Commissioners of H.M. Works and Public Buildings. Mr. J. Rutherford, A.R.I.B.A., H.M. Office of Works, Carlisle Place.

LONDON.—July 28.—For the carrying out of certain painting and distempering works at the casual wards, Eastfield Street, Limehouse, for the Guardians of Stepney Union. Guardians' Offices, Barnes Street, Stepney, E.

MANCHESTER.—July 25.—For the replating of the electric accumulator at the Cottage Homes, Styal, Cheshire. Mr. David S. Bloomfield, Union Offices, All Saints, Manchester.

MARDEN.—July 29.—For the execution of summer repairs at the Council school. Mr. T. A. Fowle, West End Villa, Marden, Kent.

MINSTER, NEAR RAMSGATE.—July 28.—For the distempering, painting, &c., at the cottage homes and school buildings, Manston, for the Guardians of the Isle of Thanet Union. Mr. W. T. Stock, architect, 57 Queen Street, Ramsgate.

MOLD.—July 27.—For the painting of the following schools:—Christ Church Council school, Rhyl, Prestatyn Council C.E., Newmarket Parochial, Golftyn Council infants, Custom House Lane Council infants, Queen's Ferry Council, Nerquis C.E., Mynydd Isa school, Ysserfrog C.E., Higher Kinnerton C.E. Mr. Fred Llewellyn-Jones, County Education Offices, Mold, Flintshire.

OSWALDTWISTLE.—July 30.—For erection of a riding school and alterations to existing headquarters of the 5th Lancashire Battery of the 1st East Lancashire Brigade Royal Field Artillery at Oswaldtwistle. Deposit 10*s.* Mr. William Greenwood, A.R.I.B.A., architect, Victoria Chambers, Victoria Street, Blackburn.

POCKLINGTON.—July 26.—For repairs, renovation, and certain alterations required to the school premises, for the Governors of the Pocklington Grammar school. Mr. Thomas Robson, solicitor, Pocklington, Yorks.

PORTSMOUTH.—July 26.—For the painting of the outside of the tramway car sheds, workshops, traffic offices and stores at Gladys Avenue, North End, Portsmouth, for the Tramways Committee. Mr. V. G. Lironi, M.I.M.E., A.M.I.E.E., Engineer's Office, Fratton Grove, Portsmouth.

ST. HELENS.—July 27.—For extension of the Council school in Robins Lane, St. Helens, for the Education Committee. Deposit 1*l.* 1*s.* Mr. Frank S. Biram, architect, George Street, St. Helens.

SAUNDERSFOOT (PEMBROKE).—Aug. 3.—For the erection and completion of a new drill-hall, armoury, lecture-rooms, caretaker's house, boundary walls, &c., at Saundersfoot, for the Pembrokeshire Territorial Force Association. Mr. J. Preece James, architect, Tenby.

SCOTLAND.—July 27.—For mason, joiner, slater, plasterer, and plumber work in connection with the proposed supplementary class-rooms, for the Brydekirk School Board. Apply by July 23 to Mr. Fred. W. Moffat, Clerk, School Board Office, Kirtlebridge.

SCOTLAND.—July 27.—For the mason, carpenter, plaster, and slater works of alterations and additions to the dwelling-house at Brownhills, Hatton, Fintray. The tenant at Brownhills.

SCOTLAND.—Aug. 4.—For the mason, joiner, plumber, plasterer, slater, glazier, painter, heating and steel-work, of new premises, Bank Street, Lochgelly, for the Equitable Co-operative Society, Ltd. Deposit 1*l.* 1*s.* Messrs. A. Scobie & Son, architects, Dunfermline and Lochgelly.

SOUTHEND-ON-SEA.—For the erection of business premises, London Road, Southend-on-Sea. Messrs. Burles & Harris, architects, Clarence Chambers, Southend-on-Sea.

SOUTHSEA.—July 25.—For cleaning down, colouring walls, painting, &c., at the headquarter drill hall of the

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1st Wessex Brigade, R.F.A., at St. Paul's Road, Southsea. Messrs. Rake & Cogswell, architects, Prudential Buildings, Portsmouth.

STAFFORD.—July 26.—For the construction of new engine house foundations and pump chamber for additional machinery about to be installed at the waterworks pumping station, Milford, for the Stafford Corporation. Deposit 2*l.* 2*s.* Mr. W. Plant, A.M.I.C.E., borough and waterworks engineer, Borough Hall, Stafford.

SWANSCOMBE.—July 29.—For the erection of new County School at Swanscombe, Knockhall, close to Greenhithe Station. Plans and specifications, with form of contract, may be inspected at offices of the education committee between 10 and 4 (Saturdays excepted), at Caxton House, Westminster. Tenders to be sent to the Secretary, Attendance Committee, J. C. Hayward, Esq., Sessions House, Dartford, Kent, by August 15.

TWICKENHAM.—July 27.—For the erection and completion of a public elementary school building, latrines, playshed, boundary walls, and other works in connection, on land in Hartington Road, Twickenham, for the Twickenham Urban District Council. Deposit 3*l.* 3*s.* Mr. Fred. W. Pearce, F.S.I., surveyor, Town Hall, Twickenham.

WALES.—July 26.—For the painting and colouring the Central, Church of England, Queen Street and Arael schools during the midsummer holidays, for the Abertillery Urban District Council Education Committee. Mr. N. J. Llewellyn, secretary, Council Offices, Abertillery.

WALES.—July 27.—For additions and alterations to the Council school at Tegryn, Pembrokeshire. Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

WALES.—July 27.—For the erection of fourteen houses at Porthcawl. Mr. D. J. Rees, Brynderwen, Porthcawl.

WALES.—July 30.—For painting and decorating the Llwynypia and Tonypandy Conservative Club, Tonypandy, for the Committee.

WATFORD.—July 25.—For the erection of a children's home in the Ashby Road, Watford, for the Guardians. Mr. C. P. Ayres, architect, 6 The Parade, Watford.

WEST VALE.—July 30.—For the various trades required in erection of a warehouse and stables at West Vale, Halifax. Messrs. Chas. F. L. Horsfall & Son, architects, Lord Street Chambers.

WORKSOP.—Aug. 8.—For laying about 5,400 yards of 12-inch, 9-inch, and 6-inch glazed earthenware and cast-iron pipes, sewers, and construction of manholes, tanks, filters, &c., at Wales and Wales Bar. Deposit 5*l.* 5*s.* Mr. James Snow Whall, 66 Bridge Street, Worksop.

WORKSOP.—Aug. 6.—For provision and laying about 2,000 lineal yards of 9-inch earthenware sewers, 280 yards 6-inch manhole ventilators, &c., and construction of tanks, filter and other appurtenant works at Barlborough. Mr. James Snow Whall, 66 Bridge Street, Worksop.

WORTHING.—July 26.—For the painting and colouring the interior of the following schools for the Education Committee, viz.:—Broadwater, Davisons, and St. George's. Mr W. Verrall, town clerk.

WREXHAM.—July 25.—For the construction of a roof over part of the vegetable market, together with other works, for the Town Council. Deposit 1*l.* Mr. John England, borough engineer, Willow Road.

YARDLEY GOBION.—July 27.—For taking off a portion of the roof, raising the walls, and re-fixing the roof of the men's dormitory, at the Workhouse, Yardley Gobion, Northants. The Workhouse, Yardley Gobion. Mr. S. H. Hardwick, master.

PLANS have been approved by the Birmingham education committee for a school to be erected in Cherrywood Road, Bordesley Green.

THE town architect, Leith, has issued to the Leith Town Council a report on the proposed public hall and library for the town. The report states that for a public hall surplus land acquired by the tramway undertaking at Leith Walk was adequate, having an area of 2,230 yards. The buildings on the site were old, and the architect considered a fair present value of these was 7,000*l.* The main hall of the proposed building would accommodate 2,450 persons, and an upper hall would seat 175. The cost of erection, including ordinary furnishings, would be approximately 24,000*l.* The cost of a hall and library on an alternative site near the foot of Leith Walk would be 55,000*l.*, including—site 15,000*l.*, compensation 2,000*l.*, hall 26,000*l.*, and library 12,000*l.* A special committee recommend the dropping of the proposal to build a library, but that the public hall be erected on the tramway site.

TENDERS.

BROOKLANDS.

For alterations and additions to Woodheys. Mr. E. H. KESSEN, architect, Ashton-on-Mersey.

Hamilton & Son	£2,184 0 0
Scott & Fenton	2,100 0 0
Burgess & Galt	2,097 0 0
Thorpe & Sons	1,997 0 0
T. & T. Parish	1,995 0 0
Byrom	1,991 0 0

DUNSTABLE.

For the erection of a new Council school, for the Bedfordshire County Council. Messrs. GOTCH & SAUNDERS, architects, Kettering.

Barber	£3,947 0 0
Foster	3,900 0 0
Nash	3,829 0 0
Patrick	3,808 0 0
Honour & Sons	3,770 0 0
Beardsmore & West	3,769 0 0
Martin	3,750 0 0
Wilkins	3,737 0 0
Hinkins & Son	3,720 0 0
Henson & Son	3,660 0 0
Hacksley Bros.	3,629 0 0
Higgs	3,600 0 0
Lewin & Son	3,483 0 0
Brown & Sons	3,450 0 0
Drever	3,297 0 0

FOOTSCRAY.

For the enlargement of Longlands Council school at Footscray, Kent, for the Kent education committee. Mr. WILFRID H. ROBINSON, M.S.A., architect.

Smith & Co.	£2,034 0 0
Sutton	1,893 0 0
Crossley & Son	1,830 0 0
J. & C. Bowyer	1,806 0 0
Wallis & Sons	1,742 0 0
H. & G. Taylor	1,727 10 0
Thomas & Edge	1,680 0 0
Ingleton	1,677 0 0
Davison	1,675 0 0
Owen & Son	1,675 0 0
Tong	1,667 0 0
Bowes	1,665 0 0
Knight	1,662 0 0
Foster	1,653 0 0
Podger & Sons	1,633 0 0
Skinner	1,629 0 0
Bishop & Sons	1,625 0 0
Baker & Son	1,619 0 0
Nightingale	1,616 0 0
Knight	1,577 0 0
Friday & Ling, Northend Works, Erith (*recommended*)	1,570 0 0
Ellingham	1,543 0 0
Bowles	1,535 0 0
Webster & Son	1,498 0 0

GREAT MISSENDEN.

For the restoration of The-Lee Church, Great Missenden, Buckinghamshire. Mr. GEO. H. FELLOWES PRYNNE, F.R.I.B.A., architect, 6 Queen Anne's Gate, Westminster, S.W. Quantities by Mr. R. HENRY HALE, F.S.I., 6 Queen Anne's Gate, Westminster, S.W.

Goddard & Sons	£1,684 0 0
H. & A. Wright	1,547 0 0
Walden & Cox	1,540 0 0
Bowman & Sons	1,492 0 0
Wilkins & Sons	1,488 0 0
Darlington	1,484 0 0
Webster & Cannon	1,411 0 0
HONOUR & SONS, Tring (*accepted*)	1,395 15 11

GREENWICH.

For paving part of Westcombe Park Road.

Woodham & Sons	£397 0 0
Anderson	377 0 0
Fry Bros.	369 0 0
MOWLEM & Co., Grosvenor Wharf (*accepted*)	358 0 0

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LONDON.

For providing and fixing the necessary heating apparatus in the Sherington Road school, Greenwich.

Wontner-Smith, Gray & Co.	£759 0 0
Stevens & Sons	683 0 0
Christie	606 10 0
Cannon & Sons	598 0 0
J. & F. May	566 10 0
Tilley Bros.	546 8 0
Cannon & Hefford	529 15 0
Palowkar & Sons	522 0 0
Brightside Foundry and Engineering Co.	507 0 0
General Iron Foundry Co., Ltd., 43 Upper Thames Street (*recommended*)	504 0 0
Architect's estimate	565 0 0

For the supply of low-tension cables, cable boxes, &c., required in connection with the wiring for power purposes of the central car repair depot, for the L.C.C.

Callender's Cable and Construction Co.	£1,053 4 6
British Insulated and Helsby Cables	1,053 0 1
Henley's Telegraph Works Co.	1,016 2 7
Siemens Bros. & Co.	1,011 12 0
Glover & Co.	1,004 9 2
Johnson & Phillips	979 12 2
Western Electric Co., North Woolwich, E. (*recommended*)	948 14 2
Estimate of the chief officer of tramways	980 0 0

For the alteration of the superstructure of Battersea Bridge, and the supply of special work in connection with the construction, on the underground conduit system of electric traction, of the authorised tramways from Battersea Park Road to King's Road, Chelsea.

Finch & Co.	£11,759 7 5
Perry & Co.	9,592 0 0
Head, Wrightson & Co.	9,083 6 4
Muirhead & Co.	8,999 16 6
Thorne & Sons	8,544 2 10
Mowlem & Co.	8,455 0 0
Handyside & Co.	8,327 10 6
Orr, Watt & Co.	7,766 10 2
Patent Shaft and Axletree Co.	7,619 7 0
Kirk & Randall	7,494 0 0
Widnes Foundry Co.	7,439 2 0
Rowlingsons & Co.	7,365 10 9
Dick, Kerr & Co., Ltd., Abchurch Yard, E.C. (*recommended*)	6,843 17 0
Chief engineer's estimate	6,995 0 0

For additions and alterations to the general storeroom at Hanwell Asylum, and for alterations and additions to male ward 19 and the general bathroom, for the L.C.C.

Chambers & Co.	£3,689 10 0
Lawrence & Sons	3,372 0 0
Leslie & Co.	3,289 0 0
Lovatt	3,109 0 0
Dickens	3,100 0 0
Higgs & Hill	3,084 0 0
Greenwood	3,047 0 0
Dorey & Co.	2,796 0 0
CARMICHAEL, Wandsworth (*accepted*)	2,675 0 0

For carrying out minor improvements at the Hanover Street school, Islington.

C. P. Roberts & Co.	£780 0 0
Grover & Son	745 0 0
Markham & Markham	719 0 0
McCormick & Sons	687 0 0
Williams & Sons	660 0 0
Willmott & Sons	655 0 0
Stevens & Sons	628 0 0
L. H. & R. Roberts	625 0 0
Lawrance & Sons	570 0 0
Mather, 38 Northampton Street, Islington (*recommended*)	540 0 0
Architect's estimate	597 0 0

For the provision of one penstock for the new southern low-level sewer from Deptford to Battersea.

Clayton Goodfellow & Co.	£375 0 0
Glenfield & Kennedy	270 0 0
Cochrane	249 0 0
Markham & Co.	235 0 0
Blakeborough & Sons, Brighouse (*recommended*)	187 0 0

LONDON—*continued.*

For the supply of Guernsey granite setts for the permanent way of the L.C.C. tramways.

A. 1,000 tons, size 3 inches by 6 inches, delivered by van to Oval Depot.
B. 500 tons, size 3 inches by 6 inches, delivered by barge to Deptford Wharf.
C. 500 tons, size 4 inches by 6 inches, delivered by barge to Metropolis Wharf.
D. 500 tons, size 4 inches by 6 inches, delivered by barge to Bridge Wharf.
E. 500 tons, size 4 inches by 6 inches, delivered by van to Oval Depot.
F. 500 tons, size 4 inches by 6 inches, delivered by barge to Deptford Wharf.

	Price a Ton. A	B	C	D	E	F
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Brookes, Ltd..	33 5	31 10	27 6	27 6	27 11	26 6
Tims	33 5	31 10	27 6	27 6	27 11	26 6
Griffiths & Co., Ltd.	30 3	28 3	24 9	24 5	26 3	24 3
A. & F. Manuelle	29 6	28 0	24 7	24 7	25 6	24 0
Fry Bros.	29 5	27 8	25 3	25 0	25 5	23 6
J. MOWLEM & Co., Ltd. (*accepted*)*	29 0	27 3	24 3	24 0	25 0	23 3

* Tender amounts to £4,543 15*s.*
Estimate of chief officer of tramways, £4,820.

For sundry repairs to vacant and other houses at the Licensed Victuallers' Asylum, Old Kent Road, S.E. Mr. W. F. POTTER, architect.

Best	£147 17 6
King & Son	119 0 0
Dawes	115 0 0
Ansell	110 0 0
Garner	89 17 6
Eames	84 0 0
PICKARD, Bow (*accepted*)	49 10 0

For repairs to conservatory at above Licensed Victuallers' Asylum.

COOPER, Old Kent Road (*accepted*).

For alterations at the Police Station at Canning Town. Mr. J. DIXON BUTLER, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Ansell	£4,200 0 0
Jarvis & Sons	4,040 0 0
Shurmur & Sons	3,962 0 0
Grover & Sons	3,940 0 0
Harris & Wardrop	3,920 0 0
Todd & Newman	3,882 0 0
Roome & Co.	3,798 0 0
Eyre	3,775 0 0
Sabey & Son	3,746 0 0
Willmott & Sons	3,704 0 0
Lawrence & Sons	3,637 0 0
Maddison	3,553 0 0

For adaptation of iron building as school for physically defective children at Basnett Road, Battersea, for the L.C.C.

Croggon & Co.	£420 0 0
Humphreys, Ltd.	247 0 0
McManus	241 0 0
Harbrow	230 0 0
Boulton & Paul, Ltd., Rose Lane, Norwich (*recommended*)	221 16 0

For provision of teachers' room at Rushmore Road school, Hackney, for the L.C.C.

Hawkins & Sons	£259 0 0
Jackson	235 0 0
Silk & Son	231 0 0
Mather	225 0 0
Shurmur & Sons	222 0 0
Grover & Son	220 0 0
Lawrence & Sons	192 0 0
McCormick & Sons	187 0 0
Price	176 0 0
Roberts	163 0 0
Lawrance & Sons	149 0 0
Bull, Somerset Works, Upper Clapton (*recommended*)	132 10 0

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LONDON—*continued.*

For provision of teachers' room at Albion Street school, Rotherhithe, for the L.C.C.

Smith & Co.	£275	0	0
Goad	221	0	0
Appleby & Sons	184	0	0
Turnbull & Son	178	0	0
Leng	178	0	0
Holloway	178	0	0
Chalkley	163	0	0
Groves, Stockwell Street, Greenwich (*recommended*)	145	0	0

For certain alterations to the Bermondsey Town Hall, for the Borough Council.

Angel	£512	0	0
Lowe & Co.	488	0	0
Greenwood (*recommended*)	418	10	1

For painting and redecorating the Bermondsey Town Hall, for the Borough Council.

Vercker & Co.	£1,750	0	0
Angel	1,448	0	0
Greenwood	1,360	0	0
Lowe & Co.	1,255	0	0
Adams & Co.	1,111	15	0
Franks, 1 Bedford Road, Clapham (*recommended*)	1,100	0	0

For erection of playsheds at certain County Council schools, for the L.C.C.

Alexis Street, Bermondsey.

Appleby & Sons	£151	0	0
Maxwell Bros.	125	0	0
Rice & Son	119	0	0
Fitch	117	15	0
Ford & Sons	116	10	0
Leng	112	0	0
Harbrow	92	0	0
Roome & Co.	97	0	0
Parker & Sons, 124 Sumner Road, Peckham (*recommended*)	85	0	0

Devons Road, Bow and Bromley.

Jackson	250	0	0
Symes	195	0	0
Willmott	189	0	0
Horswill	188	0	0
Grover & Son	175	0	0
Silk & Son	165	0	0
Bull	159	0	0
Stapleton & Sons	156	0	0
Newell & Lusty	155	0	0
Calnan & Sons	149	0	0
Griggs & Son, 71 Manchester Road, Cubitt Town (*recommended*)	137	10	0

Beresford Street, Newington.

Maxwell Bros.	89	0	0
Garrett & Son	86	0	0
Downs	74	0	0
Smith & Co.	70	0	0
Ford & Sons (*recommended*)	67	10	0

For improvement of means of exit at Wilmot Street school, Bethnal Green, for the L.C.C.

Mason & Co.	£380	0	0
Willmott	333	0	0
Shurmur & Sons	319	0	0
Grover & Son	313	0	0
McCormick & Sons	289	0	0
Brand, Pettit & Co.	260	0	0
Jackson	245	4	0
Lawrance & Sons	209	0	0
Markham & Markham	189	0	0
Price, 139 Bishopsgate Street Without (*recommended*)	179	0	0

MALDEN.

For erection of the New Malden (West) school, for the Surrey education committee.

KEMP & Co., Aldershot (*accepted*)	£438	0	0

MAIDENHEAD.

For conversion of stables and coach-house into cookery and laundry rooms at Maidenhead County Girls' school, for the Berks education committee.

BISSLEY (*accepted*)	£410	0	0

MERTHYR.

For the alteration of a portion of Cyfarthfa Castle into a municipal secondary school, for the Education Authority.

Allen	£19,950	0	0
Davies & Son	19,348	0	0
Moss	18,970	0	0
Turner & Sons	17,349	3	11
Williams	16,999	0	0
Colborne	16,596	18	8
JONES BROS., Treharris (*accepted*)	16,200	0	0

MIDHURST.

For alterations and additions to the Midhurst Grammar school, for the West Sussex and Chichester Joint education committee. Mr. HAYDN P. ROBERTS, A.R.I.B.A., architect, Horsham.

Haslemere Builders	£1,200	0	0
Sandell & Sons	1,175	0	0
Duncan	1,159	0	0
Cook & Sons	1,117	0	0
Longley & Co.	1,108	0	0
Rowland Bros.	1,069	0	0
Lindfield & Son	1,031	0	0
Chapman & Co.	1,000	0	0
Deane	998	10	0
Crane Bros.	987	15	0
Crosby & Co.	935	0	0
G. Potter	930	0	0
W. POTTER, Horsham (*accepted*)	895	0	0
Architect's estimate	940	0	0

NEWPORT.

For the restoration of the tower of St. Nicholas's Church, Newport, Salop. Mr. GEO. H. FELLOWES PRYNNE, F.R.I.B.A., architect, 6 Queen Anne's Gate, Westminster, S.W. Quantities by Mr. R. HENRY HALE, F.S.I., 6 Queen Anne's Gate, Westminster, S.W.

Bowdler & Co.	£2,500	0	0
Whittingham & Sons	2,300	0	0
Bridgeman & Sons	2,196	0	0
J. & A. Brazier	2,009	7	1
Bowman & Sons	1,800	0	0
WILKINS & SONS, Bristol (*accepted*)	1,569	0	0

PONTYPRIDD.

For erection of two cottages at the Cottage Homes.

JONES, Canton, Cardiff (*accepted*)	£2,095	0	0

SOUTH SHIELDS.

For erection of co-operative store at the corner of Westcoe Avenue and St. Vincent Street, for the South Shields Equitable Co-operative Society, Ltd. Mr. J. ERNEST STOUT, architect, Commercial Chambers, South Shields. Quantities by architect.

Swales	£1,588	11	9
White	1,575	0	0
Jennings	1,571	8	7
Carruthers	1,561	13	11
Christie	1,557	12	4
Brown & Sons	1,550	0	0
Ridley	1,473	11	0
Sheriff & Sons	1,470	0	0
ALLISON, Whitburn (*accepted*)	1,430	0	0

WALES.

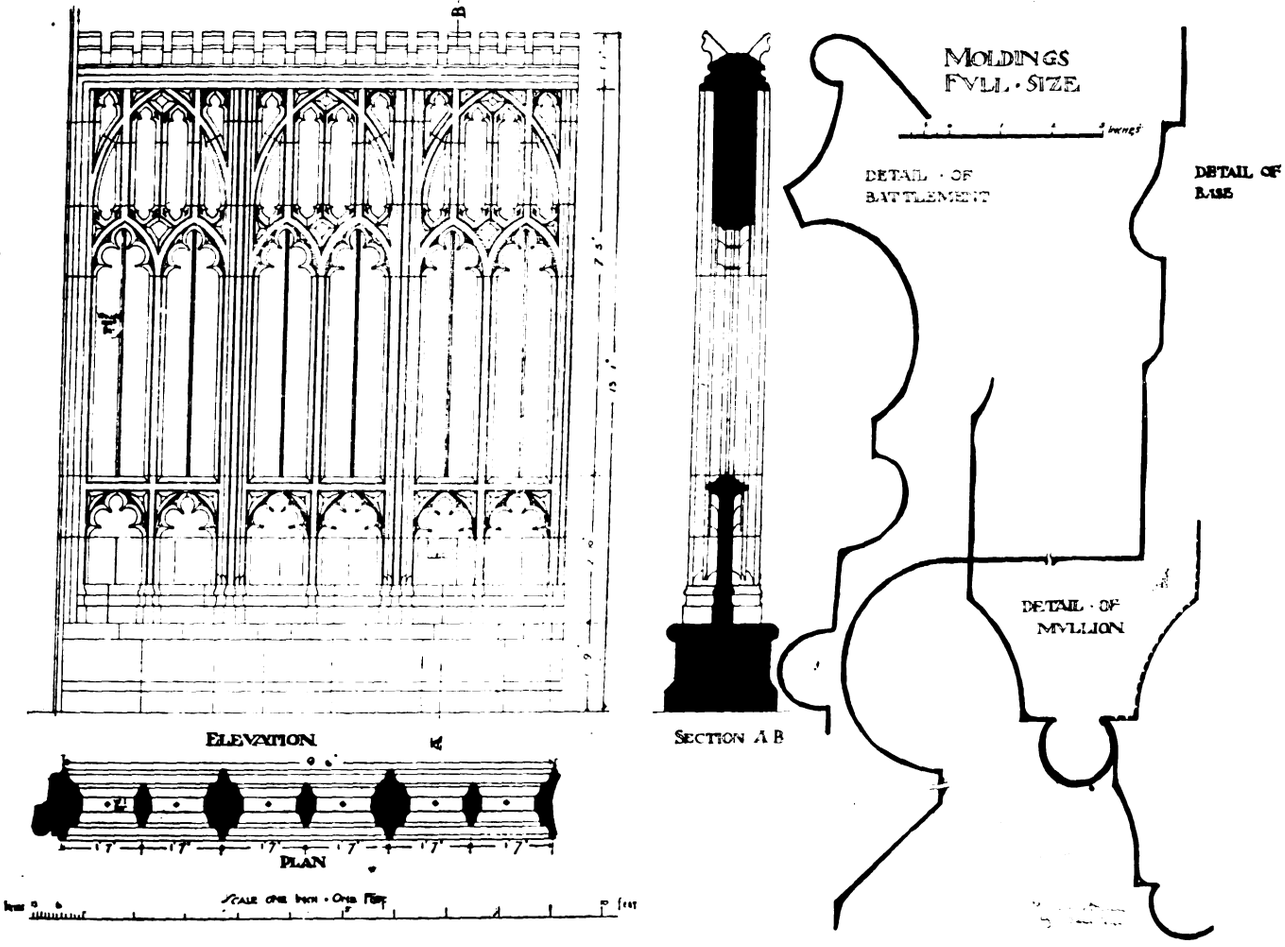
For erection of a parish hall, class room, &c. Mr. W. H. SHUTE, architect, Western Mail Chambers, Newport.

Davies & Son	£1,440	0	0
Kirby & Westacott	1,400	0	0
Dean	1,318	0	0
Williams	1,303	0	0
Partridge	1,295	0	0
Wreford	1,264	0	0
Thomas	1,258	0	0
Leadbeater	1,232	0	0
Green	1,220	0	0
James & Morris	1,207	0	0
Charles	1,198	0	0
Davies	1,187	0	0

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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

WELLS · CATHEDRAL · 15TH CENTURY · STONE · SCREEN · IN · NORTH · TRANSEPT



WANDSWORTH.

For painting works at the infirmary and at the intermediate school, for the Guardians.

At Infirmary.

Curd Bros. & Co.	£1,939 0 0
King & Son	1,515 0 0
Ronald	1,450 0 0
Wright	1,399 0 0
Adams & Co.	1,333 0 0
Woollaston & Co.	1,055 0 0
Nightingale	1,031 0 0
Woollaston Bros.	910 0 0
LOLE & Co., Trafalgar Square, Chelsea, S.W. (*accepted*)	723 0 0

At Intermediate School.

Farmer & Son	£194 0 0
King & Son	182 0 0
Nightingale	154 0 0
Curd Bros. & Co.	152 12 6
Marmoy	139 10 0
Wright	98 0 0
Adams & Co.	97 3 0
Ronald	95 0 0
Brown & Son	94 10 0
Lole & Co.	86 12 0
WOOLLASTON BROS., Rockmead Road, N.E. (*accepted*)	85 0 0

THE foundation-stone of the new building at Leeds for the Pearl Life Assurance Company, Ltd., was laid on the 14th instant by the President and founder of the Company. The total cost of the land and building will exceed 60,000*l*. The work is being carried out from the design and under the superintendence of Mr. William Bakewell, F.R.I.B.A., architect.

FIFTEENTH CENTURY STONE SCREEN, NORTH TRANSEPT, WELLS CATHEDRAL.

THE drawing by "Sans Peur" ("The Architect" Students' Sketching and Measuring Club) is of a stone screen erected during the fifteenth century, and is within one bay on the east side of the north transept.

The oldest part of the present cathedral at Wells consists of the nave, transepts, and the piers and arches of the three west bays of choir. All this was designed and built, at least the greater part of it, during the time of FitzBohun, who became Bishop in 1171, and is Transitional in character, but of very Late Transitional, the semi-circular arch being conspicuously absent. Indeed there is very little of the Romanesque or Norman about Wells; still it is there and may be noticed in the zig-zag ornament in the doorways of the north porch, the Classical character of several foliated capitals and above all the universal square abacus. The design of the nave has a decided artistic distinction of its own. In the first place the interior looks higher than it is, being only 67 feet high, but so just are its proportions, so well adjusted the tall clerestory to the stages below that to the eye the ratio of height to breadth is entirely satisfactory. Equally remarkable is the way in which the impression of great length is given. This is due to the obliteration of vertical divisions in the triforium and ground storey, which are not separated off as usual with vaulting shafts into bays. The vaulting shafts are stopped just below the cill of the clerestory, and the triforium runs in an uninterrupted arcade the whole distance from east to west.

The central tower is said to have collapsed in 1248, and many of the capitals seem to be of a still later date than this. The capitals, corbels, and the carving generally of this part of the cathedral are most spirited and interesting.

The west front is in the purest Early English, and with its magnificent sculpture is too well-known for its merits to be discussed here. After the west front was completed the undercroft and staircase to chapter-house was built, the chapter-

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house being finished about the latter half of the Geometrical period (1280-1320).

The Lady chapel, choir, and central tower were next taken in hand (1315-60), resulting in the most beautiful east end we have in England. The central tower was carried up to its present height between 1318 and 1321, the extra weight causing the four great piers to sink into the ground, and necessitating the introduction of the inverted arches peculiar to Wells. Probably the last work of the Curvilinear period was to crown the whole structure with a fine pierced parapet.

The western towers were next carried up, the south-west one being built after 1386, and the north-west one is later than 1424, but is similar in design.

Also Perpendicular tracery was inserted in many of the Transitional windows in clerestory and aisle of nave by Bishop Beckington (1442-64).

The Early English cloister was also rebuilt between 1407 and 1470.

TRADE NOTES.

MESSRS. RUFFORD & COMPANY, of Stourbridge, and of 30 Snow Hill, London, E.C., the well-known manufacturers of the Royal Porcelain Baths, write us pointing out that they are still the sole manufacturers of the Royal Porcelain Bath. They complain that cases have been brought to their notice of representatives of other firms of fireclay bath-makers stating that they are makers of Rufford's fireclay porcelain baths, and they desire to point out that they are absolutely the sole manufacturers, and would respectfully request that architects, when specifying, should state Rufford's (Stourbridge) Royal Porcelain Bath and Rufford's (Stourbridge) glazed bricks, which are hand-made, the glaze of which is exceptionally hard, does not shell, and will stand all climatic conditions, sea-water and acids included. Messrs. Ruffords have been established for over 100 years, and have earned a well-merited name for the excellence of their manufactures.

MESSRS. WM. POTTS & SONS, LTD., clock manufacturers, of Leeds and Newcastle-on-Tyne, have received instructions to erect a striking clock at the Manor House, Swanland, East Yorks, for Sir James Reckitt, Bart.

A LARGE clock with two dials and chiming the quarters has been fixed in the parish church of Edmondthorpe, near Oakham, by Messrs. John Smith & Sons, Midland Clock Works, Derby, who made the clock for the neighbouring church of Wymondham and chimes at Buckminster a short time ago.

IT is advisable during this holiday season, to be fully prepared for some wet weather, and as an overcoat becomes almost a necessary article of attire during our variable summer months, an "Omne Tempus" rainproof coat should prove very useful. Messrs. Samuel Brothers, of 65 and 67 Ludgate Hill, E.C., are the makers of these coats, and it is a distinct inducement to an intending wearer to know that this firm absolutely guarantee every coat they sell; in fact, they go so far as to state that the cloth will resist "rain, snow, sleet, or hail." An "Omne Tempus" coat does not cause the discomfort that a macintosh is apt to, but it has, on the other hand, the appearance of an ordinary overcoat.

VARIETIES.

AN elementary school is to be erected at Loose for 350 children by the Kent Education Committee.

A TOWN HALL is to be erected at Airdrie, N.B., at a cost of about 10,000*l*. A central site has been already secured in Stirling Street.

A VICARAGE at Sketty, near Swansea, is to be erected, and Mr. Glendinning Moxham, F.R.I.B.A., Swansea, has been instructed to prepare the plans for same.

MR. ARTHUR WENER ITTER, A.M.I.C.E., of Hendon, N., brick manufacturer, left estate value 52,431*l*., net personalty 4,002*l*.

MR. WILLIAM OSMENT, of Sandford House, Clapton Common, N.E., builder, left estate of the gross value of 148,886*l*. 4*s*. 1*d*.

THE Berkshire education committee have approved sketch plans for Lambourn school, providing accommodation for 100 children in three rooms and a verandah for open-air lessons.

THE Rushden Athletic Club have adopted a scheme for the extension of their premises at a cost of 800*l*. according to plans prepared by Mr. F. E. Preston.

THE plans for the enlargement of Sandhurst Council school have been approved by the Board of Education. The enlargement will provide additional accommodation for eighty-eight mixed and forty infant scholars.

THE Government of Natal have agreed to grant out of the appropriations for public works and services a sum of 20,000*l*. for the construction of a clothing factory on a selected site in the city of Pietermaritzburg.

IT is contemplated to apply for a faculty for the erection of a vestry for St. Mary's Church, Wallingford, as a memorial to the late Mr. Edward Wells, whose family have promised 500*l*. towards the cost.

THE 113th award of certificates in connection with the Crystal Palace School of Practical Engineering will take place at the school at noon on Thursday, the 28th inst. Mr. James Inglis, president of the Institution of Civil Engineers, will occupy the chair.

BEFORE deciding where to spend your holidays send a postcard to Publicity Department, 216 Marylebone Road, N.W., for A.B.C. programme of excursions arranged by the Line of Health. This publication, which gives valuable information in a concise form, has just been issued by the Great Central Railway Co.

THE British Vice-Consul at Sidon, Turkey, draws attention to the increasing demand for building accessories of all kinds, and in particular to the opening for Portland cement, hydraulic lime, iron girders, tools of all kinds, agricultural implements, and pumps (which are being substituted for the native "naura").

IN view of a suggestion of the Local Government Board that the Worcester City Council should adopt some cheaper means of getting the sewage under the Severn to the disposal works at Bromwich Lane than the 10,000*l*. deep-level sewer scheme, for which a loan was applied, the water and sewerage committee have instructed their engineer to bring up another scheme.

THE departmental committee recently appointed to inquire into the cost of school buildings have issued a letter to local authorities, stating that they would give careful consideration to any representations which it was decided to offer with regard to the reduction of the cost of building public elementary schools by the use of materials or methods of construction different from those ordinarily employed at present. The terms of reference do not deal with the planning of schools, but only with the materials used for building.

THE Belfast Tramways Committee last week considered the proposed extensions of the system in different parts of the city, including the line to M'Art's Fort, on top of the Cavehill. The estimated cost amounts to 151,000*l*., with about 10,000*l*. for road-making. The scheme includes a system of town planning, under which it is proposed to transfer 1,700 artisans' families to healthy dwellings on the side of Cavehill, together with the laying out of a large park, &c., on the top of the mountain.

MR. PATRICK W. MEIK, M.Inst.C.E., died in London last week at the age of fifty-nine. Mr. Meik was an eminent civil engineer, and was engaged in many important undertakings in this country and abroad. He was for many years head of the firm of Thomas Meik & Sons, Edinburgh. Mr. Patrick Meik had the carrying out of numerous extensive dock and other building schemes. One of his latest undertakings was the construction of the extensive works for the Aluminium Company at Kinlochleven, where water-power turbines are used, the water being obtained from a reservoir constructed by Mr. Meik, which when full forms a lake about seven miles in length. As a consulting engineer Mr. Meik's services were greatly in demand, and he was identified with works on the Continent, Spain, Greece, America, Canada, and India. Frequently he was a witness before parliamentary committees and at arbitrations on engineering questions.

A COUNCIL meeting of the London Master Builders' Association was held at 31 and 32 Bedford Street, Strand, W.C., at 3 P.M. on Thursday, July 14, when the President (Mr. Leonard Horner) occupied the chair. Reports from the office premises committee and the organisation committee were received and considered, besides the report of a committee which met the President and Council of the Royal Institute of British Architects in conference. Arrangements were made for the furnishing of the new offices in Kingsway, which will be entered in September, and new Ordinary and Associate members were elected. Several trade matters of interest were discussed, inter alia, the Newport Dock strike, and application for a working rule agreement from the Electrical Trade Union, overtime, provincial builders working in London, &c.

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MR. JOWETT, the Labour member for Bradford, asked last week in the House of Commons how many fatal and non-fatal accidents had occurred to persons employed as climbers, &c., in the work of repairing steeples and tall chimneys during the last five years, and what precautions were taken by his department to prevent accidents through loose cornices and large stones being neglected until it had become dangerous to approach or handle them, and by reason of defective repairing gear or other causes. Mr. Churchill, the Home Secretary, in his reply, said:—No statistics in respect of this class of accident are available. Such accidents would in most cases only be reportable, if at all, under Sub-section 2 of Section 185 of the Factory Act, and have not been classified separately. There is no power at present to take any action for the prevention of accidents in the construction or repair of buildings except where power is used, but a departmental committee in 1907 drew up a series of recommendations on the subject, and a Bill has been introduced in the last two Sessions to give necessary power to carry them into effect.

A COMPETITION for "Owen Jones" prizes for industrial design was instituted in 1878 by the Council of the Royal Society of Arts, as trustees of the sum of 400*l.*, presented to them by the committee of the Owen Jones Memorial Fund, being the balance of subscriptions to that fund, upon condition of their spending the interest thereof in prizes to "students of the schools of art who, in annual competition, produce the best designs for household furniture, carpets, wall-papers and hangings, damask, chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes are awarded annually on the report of the examiners in the national competition of the Board of Education. Six prizes were offered for competition in the present year, each prize to consist of a bound copy of "The Leading Principles in Composition of Ornament of Every Period," from the "Grammar of Ornament," by Owen Jones, and the Society's bronze medal. The following is a list of the successful candidates:—Norman Riseley, School of Art, Macclesfield, for a design for a woven tapestry-frieze; Arthur Henrick, School of Art, Leeds, for a design for cretonne; Percy Meakin, School of Art, Macclesfield, for a design for a woven tapestry hanging; William Morse, School of Art, South Western Polytechnic, Chelsea, S.W., for a design for a stencilled door-hanging; William B. Wright, School of Art, Macclesfield, for a design for a figured silk dress material; Nao Onuma, School of Art, Manchester, for designs for stencilled hangings and wall-paper.

ON July 14 at St. Asaph the remains of the old Priory of the Dominican Order at Rhuddlan, founded in 1197, were sold by auction by Messrs. Frank Lloyd & Sons, together with the farm comprising 108 acres. Bidding was brisk, and at 4,250*l.* it was bought by Mr. Conwy Bell, agent for the adjoining Bodrhyddan estate, owned by Mrs. Rowley Conwy. The Priory was founded in Rhuddlan, near Rhyl, in the twelfth century by Ranulph de Blundeville, Earl of Chester. The property is known as the Priory or Abbey Farm, Rhuddlan, and is a portion of the Bodelwyddan estate in the Vale of Clwyd. The Bodelwyddan family is a junior branch of the house of Wynnstay, which is descended from the Tudors of Penmynydd, and from Sir William Williams, Speaker of the House of Commons and Solicitor-General in the reign of Charles II. and James II. respectively. The present farm is built on the site of the old Abbey, about half a mile to the east of the old castle, and the stones of the old buildings are built into the walls of the farmyard barn and loft. The dormitory remains, and is now a barn and a loft, and is on the south side of the yard. In it there is an incised slab to an Archbishop of Rages. This is in the corner next to the stable door. On the stone is the saint's effigy; he is represented holding the crozier in the left hand, raising the right as if in the attitude of pronouncing the Benediction. He is also crowned with a mitre. Inscribed on the stone are fragments of French, as follows:—". . . Ovrl Aime Frere W." ". . . . Ercheveshe de Rages." In the same wall a few yards away there is another monumental stone with the following:—". . . C Jacet Edwardys, Litis de Br., Elton Cvjvs Aie Ppice." On the eastern side of the yard there is a figure of a knight in chain armour of the thirteenth century. This figure has been used by the farm hands for hanging chains on, and a considerable portion of the head is worn away. On the western side, above the doorway, is a fragment of a stone. The farmhouse stands in a garden, and in the surrounding wall, near to the gateway and mounting steps, there are traces of a traceried window, while in the garden proper is a sepulchre stone standing in the earth against the wall.

BANK HOLIDAY ARRANGEMENTS.

AUGUST BANK HOLIDAY ON THE CONTINENT.—Return tickets at reduced fares, available for fourteen days, will be issued to Brussels for the International Exhibition *via* Harwich and Antwerp. Passengers leaving London in the evening reach Brussels next morning after a night's rest on the steamer. For visiting Holland special facilities are offered by the British Royal Mail Harwich-Hook of Holland route. From the Hook of Holland through carriages and restaurant cars are run to The Hague and Amsterdam in the North and South German express trains to Cologne, Bale, and Berlin, reaching The Hague and Amsterdam early next morning, Cologne at noon, Bale and Berlin in the evening. The service to South Germany and Trieste has been accelerated, and through carriages are run between the Hook of Holland, Wiesbaden, Frankfort-on-Main, Heidelberg, Munich, and Stuttgart. The Danish Royal Mail steamers of the Forenede Line of Copenhagen will leave Harwich for Esbjerg (on the West Coast of Denmark) on Friday, July 29, and Saturday, July 30, returning August 2 and 3. The General Steam Navigation Company's steamers will leave Harwich for Hamburg on Wednesday, July 27, and July 30, returning Wednesday, August 3. The Swedish Royal Mail steamers will leave Harwich for Gothenburg on Saturday, July 30, returning from Gothenburg August 6. A new turbine steamer the *St. Petersburg*, sister ship to the *Munich* and *Copenhagen*, specially built for the Great Eastern Railway Company, has just been placed on the Harwich-Hook of Holland service. The first-class accommodation is similar to that provided by a modern Atlantic liner.

CHEAP tickets to Brussels (for the Exhibition) by the Calais, Boulogne and Ostend routes of the South-Eastern and Chatham Railway will be issued from July 27 to August 1 inclusive, available for fourteen days. Special excursion tickets will be issued to Paris, via Folkestone and Boulogne, by the services leaving Charing Cross at 10 A.M. and 2.20 P.M. on July 28, 29 and 31, and at 10 A.M. and 2.50 P.M. on Saturday, July 30. They will also be issued by the night mail service leaving Charing Cross at 9 P.M. and Cannon Street at 9.5 P.M. each evening from July 28 to 31 inclusive, *via* Dover and Calais; returning from Paris at 8.25 A.M. or 3.5 P.M., *via* Boulogne, or at 9.15 P.M., *via* Calais, any day within fourteen days. A cheap excursion to Boulogne will leave Charing Cross at 2.50 P.M. on Saturday, July 30, returning at 11.45 A.M. or 6.30 P.M. on Bank Holiday. Cheap return tickets, available for eight days, will be issued at Charing Cross from July 27 to August 1 inclusive, available by the 10 A.M. and 2.20 P.M. services. Similar tickets will also be issued to Calais by the 9 A.M. and 9 P.M. services. On Sunday, July 31, and Monday, August 1, special day excursions will be run to Boulogne and Calais. Special cheap eight-day return tickets to Amsterdam, Scheveningen, The Hague, and other Dutch towns, *via* Queenboro' and Flushing (Royal Mail route), will be issued from July 27 to August 1 inclusive, leaving Victoria and Holborn at 9.42 A.M. Cheap eight-day return tickets to Ostend will be issued from July 27 to August 1 inclusive. Special cheap tours to the Belgian Ardennes by the Calais, Boulogne and Ostend routes are also announced. During the holidays the Continental services will run as usual, with several additions. Week-end tickets, available by any train (mail and boat expresses excepted), to Tunbridge Wells, St. Leonards, Hastings, Rye, Winchelsea, Bexhill, Canterbury, Whitstable, Herne Bay, Birchington, Westgate, Margate, Broadstairs, Ramsgate, Sandwich, Deal, Walmer, Dover, Folkestone, Ashford, Shorncliffe, Hythe, Sandgate, and Littlestone-on-Sea, will be issued from London and certain suburban stations on Friday, Saturday and Sunday, July 29, 30 and 31, available for return on July 31, August 1, 2, or 3. Cheap day excursions on Bank Holiday will be run from the principal London stations to Bexhill, Birchington, Box Hill, Broadstairs, Canterbury, Deal, Dorking, Dover, Folkestone, Gomshall, Gravesend, Hastings, Herne Bay, Hythe, Margate, Ramsgate, Sandgate, Tunbridge Wells, Whitstable, &c. On Bank Holiday a special cheap day excursion will be run to Aldershot, leaving Charing Cross at 9.24 A.M. and London Bridge 9.30 A.M. Tickets (including admission) will be issued from London to the Crystal Palace (high level) on Bank Holiday. Full particulars of the excursions, extension of time for certain return tickets, alterations in train services, &c., are given in the special holiday programme and bills.

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THE BUILDERS' BENEVOLENT INSTITUTION.

THE sixty-third annual general meeting was held at 31 and 32 Bedford Street, Strand, W.C., when the President (Mr. Howell J. Williams, J.P., L.C.C.) presided.

The following report was submitted:—

The committee of management begs to submit its sixty-third annual report, and deeply regrets the continued depression in the building trade generally which is reflected in the diminution of contributions to the funds of the Institution. Every effort has been made to meet the emergency, but an additional sum of 500*l.* worth of stock has had to be sold in order to meet the calls upon the Institution funds. Some modifications of pensions have been made in consequence of the introduction of State pensions. The committee earnestly appeals to you for a continuance of your generous support upon which depends the entire or partial subsistence of the beneficiaries. The funds are administered with every necessary economy, and all needless expense is avoided. During the past twelve months four additional pensions have been given, two being granted to the widows of deceased male pensioners. There are now on the list of pensioners thirty men and twenty-three women. One male and six female pensioners died during last year. The committee thanks most heartily Mr. Howell J. Williams for his past valuable services as President and for his generous support. Also the trustees (Mr. F. J. Dove, Sir Arthur C. Lucas, Bart., Mr. T. F. Rider, Mr. J. Howard Colls, Mr. T. Stirling, and Mr. John T. Bolding); the honorary auditors (Mr. John T. Bolding and Mr. R. J. Ward, F.C.A.); and the dinner stewards.

Mr. William Willett has kindly accepted the presidency for the coming year.

The President (Mr. William Willett) will preside at the annual dinner, notices of which will be issued in due course, and supporters are urgently asked to support him on the occasion.

The audited accounts for the last twelve months were received and adopted, and the following elections were made:—*President*—Mr. William Willett; *Treasurer*—Mr. J. Howard Colls; *Hon. Auditors*—Mr. John T. Bolding and Mr. R. J. Ward, F.C.A.; *Committee of Management*—Mr. J. T. Bolding, Mr. H. Northcroft, Mr. A. Ritchie, Mr. James F. Parker, and Mr. J. W. Chessum were re-elected, and Mr. Howell J. Williams, Mr. Edward Allen, Mr. A. H. Adamson, and Mr. Ben Carter were elected.

Hearty votes of thanks were given to Mr. Howell J. Williams for his valued services and generosity to the Institution during his year of office as President, and also to the trustees, the Vice-Presidents, the hon. auditors, the dinner stewards, and the committee of management.

LONDON MAIN DRAINAGE.

A PARTY of members of the Society of Engineers (Incorporated) and their friends, by permission of Mr. Maurice Fitzmaurice, C.M.G., M.Inst.C.E., Hon.F.S.E., recently inspected, under the guidance of Mr. J. E. Worth, District Engineer, the works now in progress in connection with the Northern Low Level Sewer No. 2.

With the great increase in the population of London, it became clear that Sir Joseph Bazalgette's scheme of intercepting sewers would require extension, therefore the London County Council in 1899 decided to enlarge the main drainage system. The works of extension, which have been completed or are now being carried out under the direction of Mr. Maurice Fitzmaurice, C.M.G., M.Inst.C.E., the Chief Engineer to the Council, include on the north side of the Thames two new outfall sewers, each 9 feet by 9 feet, which have been added to the existing lines (three) of outfall sewer, and are now in use; a new Middle Level sewer, No. 2, from Willesden to Old Ford, some nine miles in length, which is also being used, and a sewer known as the Northern Low Level No. 2, which extends from Hammersmith to Bow, a distance of 12½ miles, parts of which are now under construction.

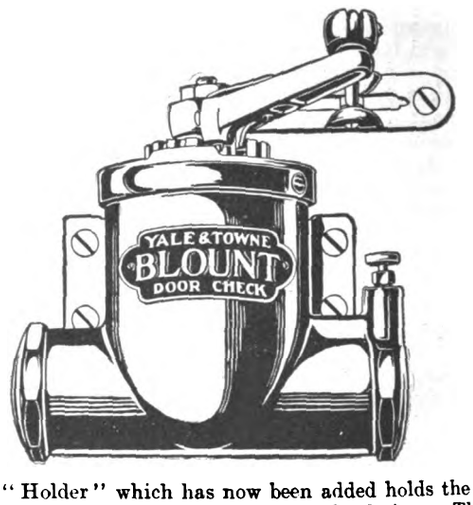
This latter sewer between Hammersmith and Pembroke Gardens, Kensington, is constructed in brickwork, and commencing with a 5-foot barrel, increases in size to 6 feet 6 inches diameter at this latter point, from which it is constructed in iron segments as far as Eastfield Street, Stepney. The diameter of the sewer in this section varies from 6 feet 6 inches to 8 feet 6 inches. From Eastfield Street to the pumping station at Abbey Mills the construction is in brick and iron, the diameter increasing from 8 feet 9 inches to 10 feet 6 inches at the latter place, where the sewage will be lifted about 43 feet into the outfall sewers, along which it will flow to the Barking Outfall Works. The depth of this sewer from the surface of the road varies from 20 feet to 70 feet, and it lies chiefly in the blue London clay, although here and there water-bearing ballast is encountered. In these water-bearing sections it has been necessary to work with compressed air up to about 8 lbs. on the square inch.

With respect to the construction of the portion of this sewer in iron, the segments are tapered on curves to the correct form, all the faces are machined, and liquid grout is employed under pressure to form a solid backing. The ironwork is lined throughout with 3 to 1 concrete, and the invert from springing to springing with 4½-inch blue brick. The work is carried on night and day, and in twenty-four hours the tunnel advances by about eight rings, each ring amounting to 1 foot 9 inches of distance.

At the Pont Street shaft, where the visit was made, the whole of the work is being carried out under compressed air with a shield.

A DOOR HOLDER AND A DOOR CHECK.

THE Yale & Towne Co., of 6 City Road, London, E.C., improving that which already seemed excellent, have further perfected their Blount Check. As familiarly known (it was the pioneer of its kind), the Blount Door Check has seemed to meet all requirements. By its use the door to which it is attached is automatically, quietly, and firmly closed, with complete absence of slamming or jarring.



The "Holder" which has now been added holds the door open at any desired point for any length of time. This is effected by an ingenious device which they describe in an attractive booklet as follows:—

"The Door Check with Holder looks almost like any Blount Door Check; but you will notice a little plug (or latch) that lifts up as you open the door. This latch doesn't catch unless you push the door back to a given point (you can set this point to suit yourself). When the latch catches at this point it holds the door open until you give a little pull; not a hard pull, just a little pull. This slips the latch up over the catch that holds it, and the door closes gently, firmly, and without slamming, as all doors close that are operated by Yale & Towne Blount Door Checks."

The advantages secured by this contrivance are as apparent as they are numerous; and it removes the one drawback which militated against the complete success of their checks. The Yale Double Acting Door Check does for double-acting doors what the Blount Door Check has long done for single doors. The company are issuing a well-printed pamphlet.

THE Lincoln City Council propose to provide a public elementary school for about 900 children, in Mount Street, Lincoln.

NEW elementary schools are to be erected at Ulceby-with-Fordington for about fifty children, and at Cadney-cum-Howsham for about eighty children.

THE Durham County Council have given formal notice of their intention (1) to provide a new public elementary school for about 280 children at or near Blackhall Mill, in the parish of Chopwell, and (2) to enlarge the Council school situated at Ushaw Moor, in the parish of Esh, by providing additional accommodation for about 130 children.

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The International News Co., 5 Bream's Buildings, Chancery Lane, London, England, and New York.

AGENTS FOR CANADA:
Messrs. WM. DAWSON & SONS, Ltd., Manning Chambers, Toronto, to whom all correspondence for Subscription and Advertising Rates should be made.
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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

BELFAST.—Sept. 5.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of bona fide design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

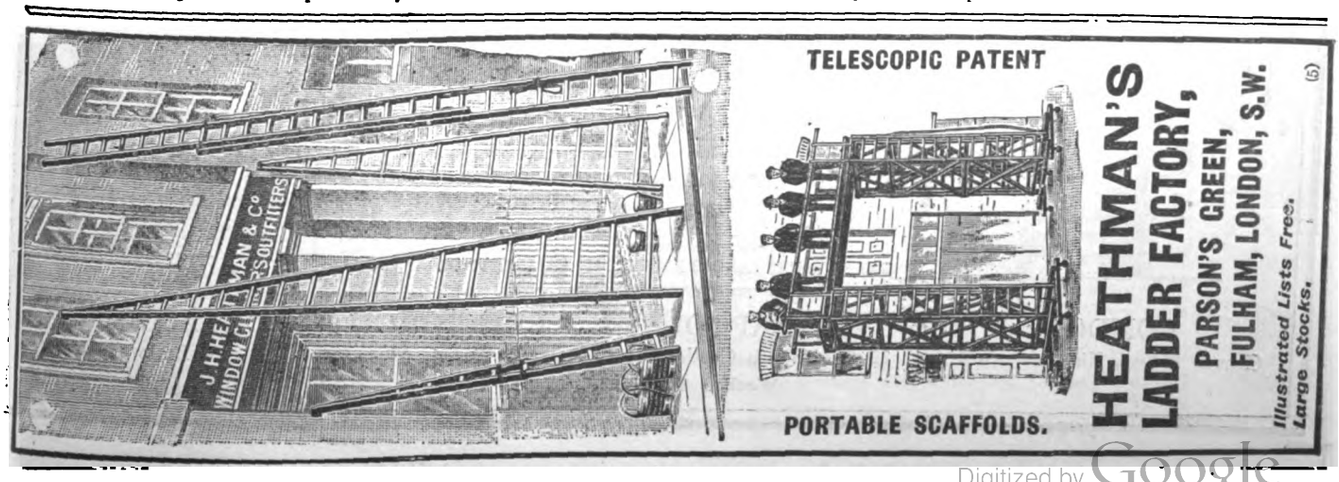
GORLESTON-ON-SEA.—August 31.—The Governors of the East Anglian Institution for Blind and Deaf Children invite plans and designs for a new building to be erected at Gorleston-on-Sea. The competition will be confined to architects having an office or residing in the areas of the following education authorities:—Cambridgeshire, Isle of Ely, Lowestoft, Norfolk, Norwich, East Suffolk, and Great Yarmouth. Copies of the instructions to architects within the prescribed areas will be sent on a remittance for 10*s.* (returnable). Documents to be sent back. Mr. D. O. Holme, clerk of the governors, Castle Chambers, Norwich.

IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

IRELAND.—Sept. 1.—The Kingstown Urban Council offer prizes of 50*l.* and 20*l.* for the best sets of plans for a Carnegie Library to be erected in Lower George's Street. Deposit 1*l.* 1*s.* Mr. J. Sherlock Vaughan, town clerk, Town Hall, Kingstown.

SCOTLAND.—The committee of Buckhaven Co-operative Society, Ltd., is prepared to receive competitive plans for proposed extension to bakery premises. Full particulars may be had from the Manager, Randolph Street, Buckhaven.

WALES. Sept. 19. The town hall committee invite competitive designs, &c., for the proposed alterations and additions (not exceeding in cost 3,000*l.*) to the town hall and market hall, Maesteg. Conditions, with a plan of site and sections at ground level, may be obtained from Mr. Samuel J. Harpur, engineer and surveyor, Town Hall, Maesteg. Two premiums are offered, namely, 25 guineas and 10 guineas, as first and second respectively. The committee do not bind themselves to award the premiums, and they do not intend to engage the authors of the designs for which premiums may be awarded to carry out or supervise the work.



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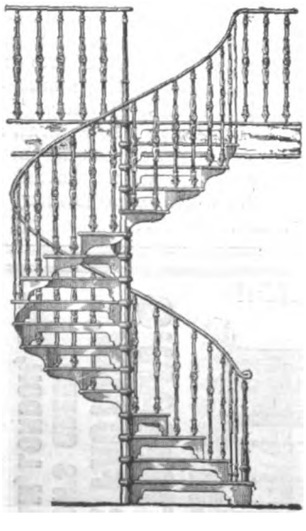
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CONTRACTS OPEN.

ALDERSHOT.—Aug. 2.—For erection of a new store at the Electricity Works, Laburnam Road, for the Aldershot Urban District Council. Mr. Fred C. Uren, surveyor, Municipal Buildings.

ASHFORD (KENT).—Aug. 8.—For the execution of summer repairs required to be carried out at the Brook Council school, for the Kent Education Committee. Mr. Wilfrid H. Robinson, architect, Caxton House, Westminster.

AYR.—Aug. 2.—For the taking down and removal of the temporary timber footbridge across the river Ayr at the Auld Brig. Mr. John Young, town surveyor, Town Surveyor's Office, Ayr.

BINGLEY (YORKS).—Aug. 9.—The West Riding Education Committee invite whole or separate tenders for the following works, viz.:—Bath, laundry, gymnasium and engineering block for the new Training College at Bingley. West Riding Architect, County Hall, Wakefield.

BIRMINGHAM.—Aug. 10.—For the construction of about 325 yards of pipe sewer in Alum Rock Road, between the L. and N.-W. Railway and Treaford Lane. Deposit 1*l*. Mr. Henry E. Stilgoe, city engineer and surveyor, Birmingham.

BISHOP AUCKLAND.—Aug. 17.—For making alterations to wards and other rooms in the old infirmary at the Auckland Union workhouse, for the Guardians of Auckland Union. Mr. F. H. Livesay, architect, Bishop Auckland.

BOOTLE.—Aug. 8.—For alterations to two existing houses at Linacre Lane Storeyard. Mr. J. Henry Farmer, town clerk, Bootle.

BOURNEMOUTH.—Aug. 4.—For alterations to the Head Post Office, Bournemouth, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l*. 1*s*. The Secretary, H.M. Office of Works, &c., Storey's Gate, London.

CAMBORNE (CORNWALL).—Aug. 6.—For erection of two semi-detached villas at Mount Pleasant Road, Camborne, for Messrs. Thomas & Sara. Mr. C. F. Thomas, Camborne.

CANTERBURY.—Aug. 8.—For certain alterations, painting, colouring and whitewashing work at the infirmary, for the Guardians. Mr. H. Doré, architect, 82 Castle Street.

CUXTON (KENT).—Aug. 6.—For the execution of summer repairs required to be carried out at the Cuxton Council school, for the Kent Education Committee. Mr. Wilfrid H. Robinson, architect, Caxton House, Westminster.

DEWSBURY.—For erection of three residences in Healds Road, Dewsbury. Messrs. John Barton & Son, architects, Halifax Road, Dewsbury.

DOUGLAS.—July 29.—For erection of retort-house roof and coal-store roof, retort stack, and retort-stack mountings at the Gasworks, Douglas. Deposit 1*l*. 1*s*., returnable. Tenders to Mr. Charles H. Kay, secretary, Gas Offices, Douglas.

DROXFORD.—Aug. 8.—For painting and general repairs to the buildings at the workhouse, for the Guardians of Droxford Union. Mr. H. Godfrey Pearson, clerk, Bishop's Waltham.

EAST PECKHAM (KENT).—Aug. 3.—For the execution of summer repairs required to be carried out at the East Peckham Council school, for the Kent Education Committee. Specifications prepared by the architect, Mr. Wilfrid H. Robinson, can be seen and information obtained of Mr. Percy C. Golesworthy, Ethel Cottage, West Malling.

EDINBURGH.—Aug. 2.—For an electric light installation at the Royal High School. Mr. J. W. Peck, School Board Offices, Castle Terrace, Edinburgh.

FARNHILL (SKIPTON).—Aug. 4.—For the mason, joiner, plumber, plasterer and slater works required in erection of a detached house at Farnhill. Mr. James Hartley, architect, Skipton.

GLASGOW.—Aug. 6.—For the formation of roads, laying drains, and erecting retaining wall at Ruchill Hospital. Mr. A. W. Myles, town clerk, City Chambers, Glasgow.

HALIFAX.—Aug. 1.—For the various works required in connection with the erection of an arcade, billiard hall and appurtenances on the Wards End Estate, Halifax. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

HASTINGS.—Aug. 3.—For the erection of covered shelters at the Hastings Workhouse Infirmary, for the Guardians. Messrs. A. W. Jeffery & Son, architects, Havelock Road, Hastings. Mr. A. R. Inskipp, clerk, 11 Wellington Square, Hastings.

HAYDON BRIDGE.—Aug. 3.—For the work of remodelling Haydon Bridge Shaftoe Trust school. Send names by July 20 with 2*l*. 2*s*. deposit to Mr. Edward Davidson, clerk to the governors, Estate Office, Haydon Bridge.

HAYWARDS HEATH.—July 29.—For repairs, painting, and other works to buildings on the estate of the Brighton County Borough Asylum. Mr. J. G. Gibbins, F.R.I.B.A., surveyor to the Asylum, 3 Palace Place, Brighton.

HIPPERHOLME (YORKS.).—Aug. 8.—For the plumber and tiler work required in erection of two villas at Hipperholme. Mr. Harry Smith, architect and surveyor, Holly Bank, Hipperholme.

HORDEN COLLIERY (DURHAM).—Aug. 6.—For supply and erection of a temporary school for 400 girls at Horden Colliery, for the Durham Education Committee. Mr. A. J. Dawson, clerk, Shire Hall, Durham.

LEEDS.—Aug. 2.—For providing foundations, benches, &c., in connection with the carriage standing and washing sheds at Waterloo Sidings, Nevill Hill, Leeds, for the North-Eastern Railway Company. Mr. William Bell, architect, York.

LONDON.—Aug. 8.—For pulling down buildings in the Lower Richmond Road, Mortlake, and removing the material, for the Barnes Urban District Council. Mr. G. Bruce Tomes, A.M.I.C.E., engineer and surveyor, Council House, High Street, Mortlake.

MACCLESFIELD.—Aug. 16.—For erection of new school buildings at the Grammar School, Macclesfield, available for 200 boys. Plans and specifications can be seen at the office of Messrs. Willink & Thicknesse, architects, 14 Castle Street, Liverpool.

MERTHYR TYDFIL.—Aug. 2.—For the following four separate contracts, for the Education Committee, viz.:—(*a*) Improvements and additions to Pentrebach school; (*b*) alterations and improvements to windows and floors of Abercanaid school; (*c*) eleven covered playsheds in school-yards in various parts of the borough; (*d*) alterations and improvements of Penyrheolgerrig infants' school. Deputy Surveyor's Office, Town Hall.

MIDDLESBROUGH.—Aug. 3.—For the whole of the works required in additions to the nurses' home at the workhouse, for the Middlesbrough Board of Guardians. Messrs. R. Lofthouse & Sons, architects, 129 Albert Road, Middlesbrough.

MONAGHAN (IRELAND).—Aug. 11.—For the following works, for the Joint Committee of the Monaghan Asylum, viz.:—(1) Repairs to gable of Protestant Church; (2) carrying out works in engine room and laundry, according to the specifications of Mr. W. A. Scott, architect, 45 Mountjoy Square, Dublin.

NEWMACHAR (ABERDEEN).—Aug. 3.—For the mason, carpenter and slater works of rebuilding and refitting byre and stable wings at Highlands, Elrick, Newmachar. Tenders to be lodged with Messrs. Burnett & Reid, 12 Golden Square, Aberdeen.

ORLESTONE (KENT).—Aug. 2.—For the execution of summer repairs to be carried out at the Orlestone Council school, for the Kent Education Committee. Specifications prepared by the committee's architect, Mr. Wilfrid H. Robinson, Caxton House, Westminster.

PEMBROKE, Co. DUBLIN.—Aug. 3.—For the execution of works in connection with the laying-out of Herbert Park, Ballsbridge, Pembroke, Co. Dublin. Copies of drawings and specifications can be obtained on payment of 1*l*. for each section. Tenders to be in two sections—(*a*) Ground work, pergola, pond, planting, &c.; (*b*) building works, including pavilion, band stand, shelters, bridges, and such like. Mr. J. C. Manly, clerk to the Council, Town Hall, Ballsbridge, Pembroke, Co. Dublin.

PONTEFRACT.—Aug. 4.—For the pulling down of the old Castle Inn and five dwelling-houses, and the rebuilding of the inn and stables in Micklegate, Pontefract, for Messrs. Walker & Co., Crown Brewery, Wakefield. Messrs. Garside & Pennington, architects, Ropergate, Pontefract.

SAUNDERSFOOT (PEMBROKE).—Aug. 3.—For the erection and completion of a new drill-hall, armoury, lecture-rooms, caretaker's house, boundary walls, &c., at Saundersfoot, for the Pembrokeshire Territorial Force Association. Mr. J. Preece James, architect, Tenby.

SCOTLAND.—Aug. 4.—For the mason, joiner, plumber, plasterer, slater, glazier, painter, heating and steel-work, of new premises, Bank Street, Lochgelly, for the Equitable Co-operative Society, Ltd. Deposit 1*l*. 1*s*. Messrs. A. Scobie & Son, architects, Dunfermline and Lochgelly.

STAFFORD.—Aug. 20.—The Staffordshire education committee are prepared to receive tenders for the supply of school furniture, for a period of one year. The Director of Education (Requisitions Department), County Education Offices, Stafford.

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WALES.—Aug. 10.—For the erection of a large bungalow at Coed-Ely, Llantrisant, Glam., for the Welsh Navigation Steam Coal Company, Ltd. Mr. Philip J. Jones, architect, Church Street, Pontypridd.

WARRINGTON.—Aug. 19.—For the erection of a public elementary school. Mr. J. Moore Murray, secretary, Sankey Street, Warrington.

WATFORD.—Aug. 5.—For the erection of new grammar school for boys, Watford, for the Governors of the Watford Grammar Schools. Messrs. Russell & Cooper, FF.R.I.B.A., 11 Gray's Inn Square, London, W.C.

WORKSOP.—Aug. 6.—For provision and laying about 2,000 lineal yards of 9-inch earthenware sewers, 280 yards 6-inch manhole ventilators, &c., and construction of tanks, filter and other appurtenant works at Barlborough. Mr. James Snow Whall, 66 Bridge Street, Worksop.

WORKSOP.—Aug. 8.—For laying about 5,400 yards of 12-inch, 9-inch, and 6-inch glazed earthenware and cast-iron pipes, sewers, and construction of manholes, tanks, filters, &c., at Wales and Wales Bar. Deposit 5*l.* 5*s.* Mr. James Snow Whall, 66 Bridge Street, Worksop.

WYKE (YORKS.).—Aug. 3.—For the trades required in the conversion of Victoria Hall, Wyke, into district baths, for the Bradford Town Council. City Architect, Town Hall, Bradford.

TENDERS.

BOURNE (SURREY).

For erecting first portion of St. Thomas's Church. Mr. HENRY S. SIDEBOTHAM, 108 High Street, Guildford, and Sir CHARLES A. NICHOLSON, Bart., architects. Quantities by Mr. B. G. THOMPSON, 5 Staple Inn, Holborn.

Holden	£2,430 0 0
Swayne & Son	2,226 0 0
F. & H. F. Higgs	2,090 0 0
Benfield & Loxley	2,020 0 0
Norris & Co.	1,990 0 0
Goddard & Sons	1,938 0 0
Mardon & Mills	1,896 0 0
Bunning & Adams	1,895 0 0
Cæsar Bros.	1,882 0 0
Crosby & Co.	1,879 0 0
Mussellwhite & Sapp	1,785 0 0

BOGNOR.

For new Congregational Sunday schools. Mr. E. J. HAMILTON, architect, Brighton.

Seymour	£1,969 9 0
Barnes & Sons	1,792 0 0
W. & T. Garrett	1,782 0 0
Burrell & Standen	1,766 0 0
Hockley & Co.	1,663 0 0
LINFIELD & SONS, Littlehampton (*accepted*)	1,559 0 0

BRISTOL.

For erection of new pavilion wards, casualty department, and other works in connection therewith, in extension of the Bristol Royal Infirmary, for the Trustees. Messrs. H. PERCY ADAMS and CHARLES HOLDEN, architects, London. Messrs. BERNARD & SON, surveyors, Bristol.

Dowling	£56,400 0 0
Perkins & Son	55,100 0 0
Love	54,933 0 0
J. & M. Patrick	52,440 0 0
Coles	52,300 0 0
Pethick Bros.	52,222 0 0
Stephens, Bastow & Co.	51,987 0 0
Blake	51,300 0 0
Hayes & Son	50,659 0 0
Colborne	50,383 0 0
Willcock & Co.	49,881 0 0
Long & Sons	49,764 0 0
Wilkins & Son	48,800 0 0
COWLIN & SON, Bristol (*accepted*)	48,726 0 0

CARDIFF.

For alterations and additions to the Minny Street laundry, Cathays, Cardiff, for the Cardiff Steam Laundry, Carpet and Window Cleaning Co., Ltd. Mr. H. BUDGEN, architect, 95 St. Mary Street, Cardiff.

Couzens & Sons	£675 0 0
Thomas & Co.	675 0 0
Knox & Wells	637 0 0
Tucker Bros.	630 0 0
MORGAN (*accepted*)	598 0 0

CLAYGATE.

For making-up part of Claremont Road, for Esher and the Dittons Urban District Council. Mr. H. C. FREAD, surveyor to the Council.

Truman & Co.	£729 0 0
Willcox & Co.	680 12 3
Free & Sons	644 0 0
Kavanagh & Co.	627 0 0
Blaker	616 15 0
Wheeler & Co.	598 0 0
May & Son	560 0 0

EDMONTON.

For fitting up laboratories at the Edmonton Latymer school, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Lawrence & Son	£197 0 0
Educational Supply Association	182 10 0
Hammer & Co.	176 0 0
Bennett Furnishing Co. (*recommended*)	166 0 0

FEATHERSTONE.

For private street works in Albert Street, Post Office Road (part of), Newport Terrace, Wilson Street, and Whiteley Street, for the Urban District Council. Mr. SAMUEL CHESNEY, engineer and surveyor, Council Offices, Featherstone. Quantities by Mr. W. H. FEARNLEY, Station Lane, Featherstone.

Sidebottom & Brown	£2,229 12 5
Speight	2,204 14 0
Coop & Son	1,984 2 0
Eyre	1,866 6 3
Clements	1,836 18 5
Haigh	1,714 16 5
MASON, Featherstone (*accepted*)	1,582 4 1
Armitage	1,580 12 6

FOLKESTONE.

For the erection of a temporary hall, Folkestone County school for girls, for the Kent education committee. Mr. WILFRID H. ROBINSON, M.S.A., architect.

Ginger, Lee & Co.	£714 0 0
The Fireproof Partition and Spandrel Wall Co.	685 0 0
(If in reinforced brickwork, 650*l.*)	
Walker	679 0 0
Smith & Co.	658 15 0
Harrison & Co.	650 0 0
Parsons	590 0 0
Priest & Son	578 0 0
Hayward & Paramor	569 0 0
Harbrow	560 0 0
Harris	554 10 0
Marx	550 0 0
Seager	537 17 6
Einfield	510 0 0
Palmer & Co.	498 0 0
Castle & Son, Folkestone (*recommended*)	474 0 0

HANWELL.

For new elementary school, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Kearley	£9,183 0 0
Neal	9,140 0 0
Rice & Son	9,050 0 0
Fassnidge & Son	8,940 0 0
Fairhead & Son	8,864 0 0
Bollom	8,840 0 0
Lacey	8,783 0 0
Dickens	8,700 0 0
Try	8,670 0 0
Lawrence & Son	8,582 0 0
A. & B. Henson	8,560 0 0
Mattock Bros.	8,417 0 0
Treasure & Son	8,333 0 0
Knight & Son, Tottenham (*recommended*)	7,932 0 0

LONDON.

For painting and decorating part of the workhouse at Ladywell Road, Lewisham. Mr. A. H. NEWMAN, F.R.I.B.A., architect. Quantities by Messrs. W. T. FARTHING & SON, for the Guardians.

Reason	£1,149 0 0

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LONDON—*continued.*

For the erection of 112 cottages on section B of the Norbury Estate, for the London County Council.

F. & H. F. Higgs	£27,288 0 0
Akers & Co.	24,150 0 0
Wallis & Sons	22,526 0 0
Smith & Sons	22,352 0 0
Gathercole Bros.	21,816 0 0
Wall	21,140 0 0
F. & T. Thorne	20,767 0 0
Rowley Bros.	20,730 0 0
Fletcher	20,526 0 0
NICHOLLS & SON, Finchley (*accepted*)	18,765 0 0

For enlargement of playground at the Central Street school, Finsbury, for the London County Council.

Mason & Co.	£661 0 0
Roberts & Co.	586 0 0
Markham & Markham	573 0 0
Glover & Son	560 0 0
Mather	550 0 0
Williams & Son	545 0 0
Bull	535 0 0
Staines & Co.	522 0 0
Price	489 0 0
Triggs	486 0 0
KING & SON (*accepted*)	407 0 0

For the extension of the girls' staircase at the Haggerston Road school, Haggerston, for the London County Council.

Silk & Son	£397 0 0
Jackson	343 11 0
Grover & Son	243 0 0
Snewin Bros. & Co.	229 0 0
McCormick & Sons	217 0 0
Butters	217 0 0
McLaughlin & Harvey	169 0 0
Marchant & Hirst	167 0 0
LAWRANCE & SONS (*accepted*)	159 0 0

For the adaptation and fitting up of the three disused buildings on the "Southfield" site (Wandsworth), for use as cookery, housewifery and handicraft centres, for the London County Council.

Rice & Son	£756 0 0
Johnson & Co.	746 0 0
Garrett & Son	710 0 0
F. & G. Foster	674 0 0
Bragg & Sons	636 0 0
Lole & Co.	580 0 0
Jewell	523 0 0
Ronald	511 0 0
TRIGGS (*accepted*)	475 0 0

For painting at Ackmar Road school, Fulham.

LOLE & Co. (*accepted*)	£229 14 4

For painting at Thornhill Road school, Islington.

STEVENS & SONS (*accepted*)	£284 0 0

For painting at Farncombe Street school, Rotherhithe.

PROCTOR & SONS (*accepted*)	£240 0 0

For painting at the Southwark Park school, Rotherhithe.

PROCTOR & SONS (*accepted*)	£203 0 0

LITTLEHAMPTON.

For cleaning and painting works, Millfield, Rustington, near Littlehampton, for the Metropolitan Asylums Board. Mr. W. T. HATCH, engineer-in-chief.

Olliver & Sons	£345 0 0
Churcher & Sons	335 10 0
Vigor & Co.	325 0 0
Crouch	317 0 0
Drake & Co.	280 0 0
Snewing Bros.	271 0 0
Jewell	270 0 0
LINDFIELD & SONS, Littlehampton (*accepted*)	269 0 0

NORFOLK.

For additions and alterations to the Free school at Scarning, Norfolk, for the Governors. Mr. GEORGE J. SKIPPER, F.R.I.B.A., architect and surveyor.

Leeds	£780 0 0
Youngs & Son	740 0 0
Mack	730 0 0
Smith	720 0 0
Wicks & Sons	716 11 10
W. S. & J. H. LARNER, East Dereham (*accepted*)	680 0 0

OLD SARUM, WILTS.

For erection of an isolation hospital at Old Sarum, in the county of Wilts, for the Salisbury and District joint isolation hospital committee. Mr. J. HUGH GOODMAN, architect, Reading. Messrs. H. COOPER & SONS, surveyors, Reading.

Grace & Sons	£18,344 0 0
Playfair & Toole	18,033 0 0
Hayes & Sons	17,292 0 0
Mussellwhite & Sapp	17,140 0 0
Hayward & Wooster	17,117 0 0
Jenkins & Son	17,108 0 0
Billett & Musselwhite	16,889 0 0
Walters & Son	16,652 0 0
Burton	16,523 0 0
Stephens, Bastow & Co.	16,453 0 0
Moore & Sons	16,262 0 0
Bowman & Sons	16,236 0 0
Bourne & Jenkinson	16,092 0 0
Wort & Way	15,972 0 0
Hughes	15,733 0 0
Nicholls	15,594 0 0
Harris Bros.	15,517 0 0
Fitt	15,497 0 0
Bloxham	15,376 0 0
Drowley & Co.	15,307 0 0
Parson Bros.	14,994 0 0
Colbourne	14,799 0 0
Higgs	13,998 0 0

PONDER'S END.

For new Technical Institute, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Rice & Son	£7,724 0 0
Lawrance & Son	7,632 0 0
Johnson & Co.	7,600 0 0
Porter	7,556 0 0
Stewart	7,393 0 0
Fitch & Cox	7,391 0 0
Brand, Pettitt & Co.	7,245 0 0
Renshaw	7,144 0 0
Treasure & Son	7,065 0 0
Lawrence & Son	6,969 0 0
Fairhead & Son	6,916 0 0
Monk	6,890 0 0
Mattock Bros.	6,877 0 0
Knight & Son, Tottenham (*recommended*)	6,724 0 0

SOUTHAMPTON.

For erecting chapel and lodge and offices at the Hollybrook Cemetery, for the Corporation. Mr. J. A. CROWTHER, borough engineer.

Chapel.

Douglas	£2,600 0 0
Osman & Co.	2,557 0 0
Wakeham Bros.	2,520 0 0
Jenkins & Son	2,493 0 0
Stevens & Co.	2,456 0 0
Franklin	2,374 0 0
Buck	2,370 0 0
NICHOL, Southampton (*accepted*)	2,341 0 0

Lodge and Offices.

Jenkins & Son	965 0 0
Stevens & Co.	948 0 0
Nichol	942 0 0
Wakeham Bros.	925 0 0
Buck	884 0 0
Osman & Co.	877 0 0
DOUGLAS, Southampton (*accepted*)	860 0 0

STANLEY.

For alterations and additions to premises in Front Street, for West Stanley Co-operative Society, Ltd. Mr. WM. FORSTER, architect, Front Street, Stanley.

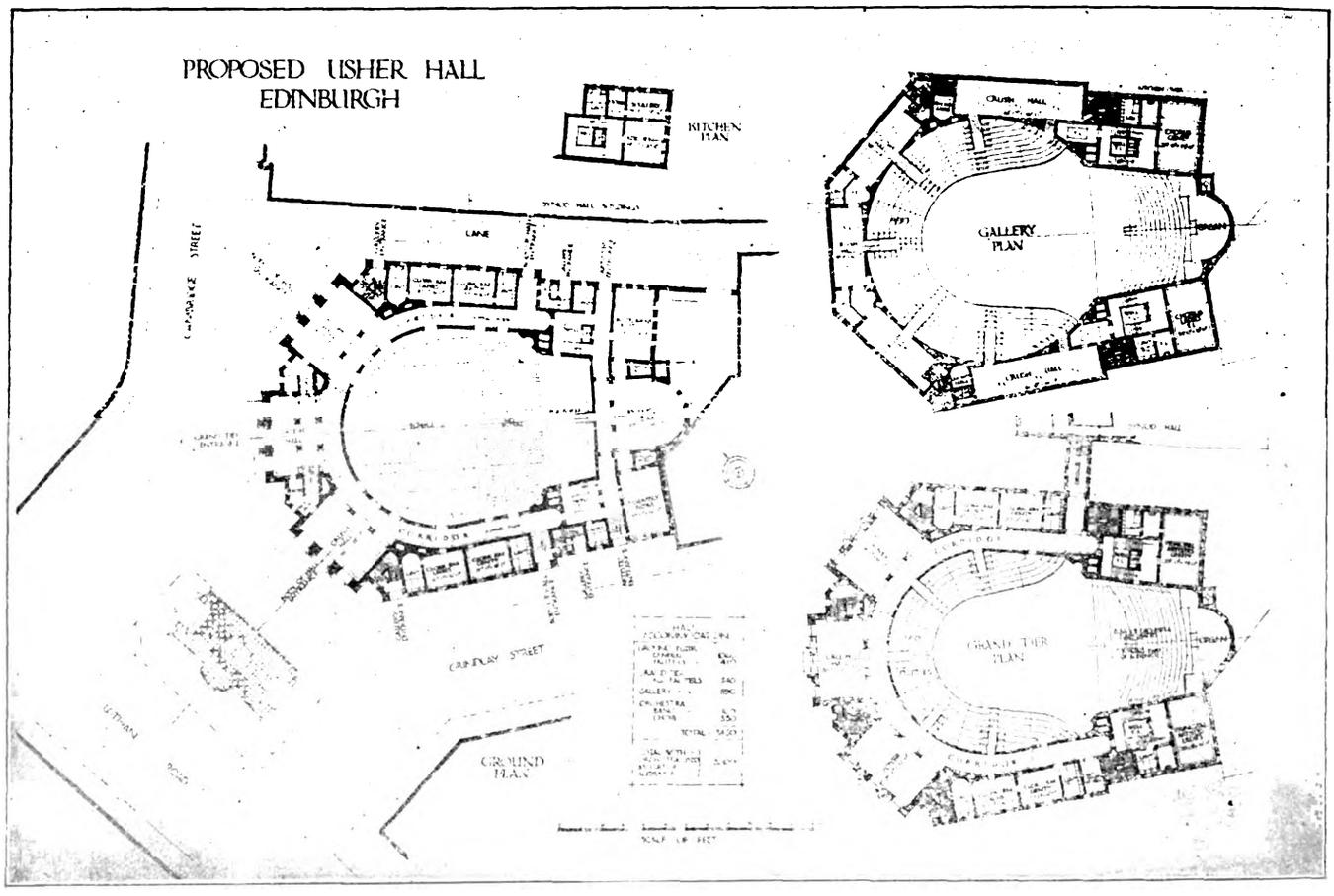
Dyson	£1,624 0 0
Duffy	1,600 0 0
Heel	1,476 10 0

TOTTENHAM.

For fitting up laboratories at the Tottenham Grammar school, for the Governors of the school. Mr. H. G. CROTHALL, architect to the education committee.

Educational Supply Association	£238 10 0
Bennett Furnishing Co.	226 0 0
Hammer & Co.	197 0 0
Brand, Pettitt & Co. (*recommended*)	185 0 0

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USHER HALL, EDINBURGH.—Selected design by Messrs. STOCKDALE HARRISON & SONS and Mr. HOWARD H. THOMSON.

SHREWSBURY.

For erecting public abattoirs, Roushill. Mr. ARTHUR E. WILLIAMS, architect and surveyor, County Chambers, High Street, Shrewsbury. Quantities by the Architect.

Higley	£6,562 18 0
Nicholas	6,082 0 0
Bowdler & Co.	5,620 0 0
Price	5,600 0 0
Treasure & Son	5,430 0 0
Pace	5,403 0 0
Morris & Sons	5,340 0 0
Bickerton	5,275 0 0

WROTHAM (KENT).

For erection of Wrotham Borough Green Council school, for the Kent education committee. Mr. WILFRID ROBINSON, architect.

Allcorn & Sons	£4,892 10 0
Foster	4,878 0 0
Crossley & Son	4,695 0 0
Sutton	4,585 0 0
Lonsdale	4,561 0 0
Ballard	4,549 0 0
Burrows	4,490 0 0
Curtis	4,476 0 0
Browning	4,372 0 0
Norris	4,370 0 0
Wallis & Sons	4,320 0 0
Gates & Sons	4,275 0 0
Wood & Sons	4,259 0 0
Bowes	4,232 0 0
Baker & Son	4,223 0 0
Godden & Sons	4,189 0 0
Archer & Son	4,173 0 0
Davison	4,167 0 0
Podger & Sons	4,161 0 0
SKINNER, Chatham (*accepted*)	4,160 0 0

VARIETIES.

THE streets and buildings committee of Edinburgh Town Council had a meeting on July 21, with reference to a site for the memorial to the Marquis of Linlithgow. It was agreed to recommend a site at the south-east corner of Charlotte Square. It is proposed to erect the memorial on the pavement, which will be suitably treated for the purpose.

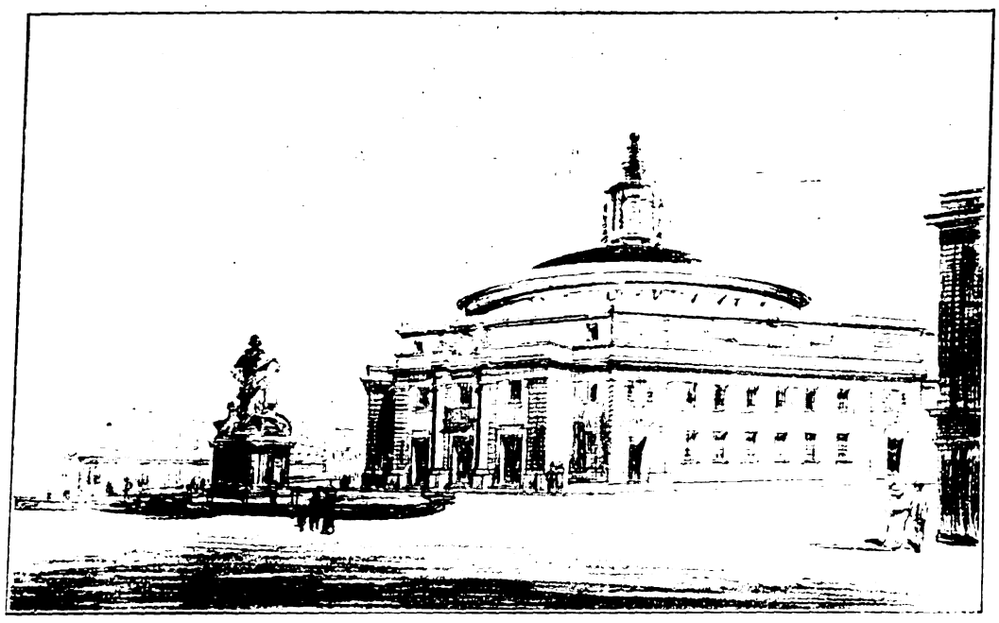
THE Victoria and Albert Museum has acquired a group of drawings by the late George du Maurier from the exhibition of the famous *Punch* artist's works which is now being held at the Leicester Galleries, Leicester Square, under the title of "'Society' in Late Victorian Days." The exhibition was to have closed at the end of this month, but owing to its continued success Messrs. Brown & Phillips have decided to keep it open until the middle of August.

A STATUE of the late Lord Burton, by Mr. F. W. Pomeroy, A.R.A., is to be erected by public subscription opposite Burton-on-Trent town hall, and a marble bust for presentation to the Dowager Lady Burton has been completed, and will be exhibited shortly in the hall. The inscription to be placed under the statue will read:—"Erected by upwards of 6,000 of his friends and fellow-townsmen, in remembrance of one whose life was devoted to the good of others."

THE Finsbury Borough Council have granted a contract for ten years to the Gas Light and Coke Company for the lighting of all their streets by new inverted-burner lamps, which will show an increase in total illuminating power of 100,000 candle-power over the existing system of lighting, but with a reduction in cost of 525*l.* a year. This decision was taken after the latest examples of gas and electric lighting had been carefully inspected and relative costs considered.

A LETTER has been received by the Council of the Leeds University intimating that the Court of the Worshipful Company of Clothworkers has voted 5,000*l.* for an additional building to complete the front elevation of the Clothworkers' wing in College Road, and to provide extensions necessary for teaching the French system of worsted combing, drawing, and spinning. The grants previously contributed to the University on capital account from the same source amount to 70,000*l.*

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USHER HALL, EDINBURGH.—Selected design by Messrs. STOCKDALE HARRISON & SONS and Mr. HOWARD H. THOMSON.

THE Corporation of Merthyr Tydfil propose to convert Cyfarthfa Castle into a municipal secondary school, which will be the first free school of that character in the county of Glamorgan. The number of scholars to be provided for is over 500, and the total cost is expected to amount to about 20,000*l.* The plans have been approved by the Board of Education.

THE memorial to Sir Henry Campbell-Bannerman, by Mr. Paul Montford, will be ready to be placed in Westminster Abbey in September. It is a colossal bust of the late Prime Minister, showing him in the robes of a Companion of the Bath. The bust, standing on a pedestal of red marble, will be placed in a niche in a carefully designed scheme, consisting of bronze pilasters with capitals and a frieze and cornice in which laurel leaves and honeysuckle play a leading part.

THEIR Royal Highnesses Prince and Princess Alexander of Teck on Thursday in last week laid the foundation-stones of two houses which are to be erected at Woodford Bridge, Essex, where a garden city for boys is in course of development in connection with Dr. Barnardo's Homes. Thirty houses are to be erected, to accommodate about a thousand waifs and strays from London.

PERMISSION has been given by the London County Council to the Housing of the Working Classes Committee to apply for Parliamentary powers in regard to the development of the White Hart Lane estate, Tottenham. At present, it was stated, only fifty-five out of 225 acres had been dealt with. As only dwellings for the working classes could be erected on land held by the Council under Part III. of the Act of 1890, the committee now desired powers to lease a portion of the land for development on the lines of the Hampstead Garden Suburb. The White Hart Lane estate of the London County Council is rather a white elephant.

THE plans have now been prepared for the new buildings of the L.C.C. School of Photo-Engraving and Lithography, Bolt Court. The accommodation will include in the basement a museum, stores and offices; on the ground floor, a reading room, lecture room to seat 100, preparation room and store, principal's room, master's room, and clerk's office; on the first floor, dark rooms, spectroscope room, chemical store, photographic studio, and plate-cleaning room; on the second floor, etching room, proving room, and mounting and electrotyping room; on the third floor, stone-preparing room, lithodrawing and proving rooms, photogravure and collotype room, and collotype-printing rooms; and on the fourth floor, life room, antique room, colour-composition room and store.

A WELL-KNOWN house at Pompeii (No. 39, in the second Insula of the eighth Region), named after the Emperor Joseph II., who visited it when first laid bare a century ago, has been lately completely excavated. It is three-storeyed and of terrace construction, having been built against the steep side of the mountain. The upper storey presents the usual plan of a Roman house. A staircase of twenty-eight very well-preserved steps of Vesuvian lava, divided into three flights, or landings, leads to the lower floor. The topmost landing and the two upper portions of this staircase have wooden balusters; the lowest portion, which is also the largest, is vaulted over. Two very plain rooms, with rough walls, one of them having a hearth, open on to this staircase. At its foot there is a long passage leading to a back staircase, which again leads to the upper storey. Proceeding, however, straight on, the visitor will find himself in a court, or kind of peristyle, on each of two sides of which there are two chambers, the third side being occupied by a large room, most probably the triclinium, or dining-room. The fourth side opens on to a great terrace, from which the courtyard and the rooms are lighted. Beneath this terrace is the lowest storey, comprising the various offices, kitchen, bakery, mill, bath, &c. The bath consists of a tepidarium, a vaulted room, with a white mosaic floor, the walls painted yellow; a calidarium, also vaulted, the walls adorned with pictures on a red ground, the floor mosaic; the frigidarium, circular, as usual, having a cupola-formed vaulted room with an air-opening in the middle, furnished with a wide ventilating shaft of terra-cotta.

WITH regard to the proposed erection of a new bridge over the Ouse at Booth Ferry, although the West Riding is prepared to contribute one-third of the cost, as expressed in the following resolution passed by the Council—"That the West Riding County Council do contribute upon such terms and conditions as the West Riding highways committee shall approve, the sum of 15,000*l.*, being one-third part of a sum not exceeding 45,000*l.*, the estimated cost of erecting a bridge over the river Ouse at Booth Ferry in the Goole rural district, subject to a like amount being contributed by the East Riding County Council and the Goole Urban Council, the working expenses and general upkeep of the bridge when completed to be borne by the three authorities in like proportion"—the highways and bridges committee of the East Riding County Council has resolved:—"That the committee are unable to recommend the East Riding County Council to contribute so large a sum as 15,000*l.* towards the cost of a new bridge over the river Ouse, but that the committee are prepared to recommend the council to adhere to their offer made at the meeting of the council held on July 29, 1907, to contribute a third of 26,000*l.* on the following conditions, viz.:—(1) That the tolls to be levied in the first instance be fixed at such a rate as may be reasonably expected to provide for the annual cost of working, and also to provide for the interest on any repayment of the capital; (2) that the liability of the East Riding County Council be limited in any event to a guarantee of one-third of any deficit there may be after taking credit for the tolls; (3) that no provision be inserted in any Bill to be promoted making it compulsory that the bridge shall become a free bridge upon the extinction of the loan; and that it be a suggestion to the joint committee to approach the Road Development Board with a view of ascertaining what contribution they would be prepared to make to meet the increased estimate."

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THE executive committee of the Irish branch of the Surveyors' Institution at a recent meeting again considered the valuation sections of the Finance Act, 1909-10, and an important letter was read from Somerset House, intimating that Forms I., II., and IV., for obtaining returns for valuation purposes in Ireland, are not yet ready for issue. These forms have been in circulation in England for a considerable time, and the letter from the Inland Revenue would appear to indicate that a different procedure is to be set up in Ireland.

MR. PECK, City Astronomer for Edinburgh, has been asked by the Mills Bequest Trustees to visit Dundee and report on the question of a site for the proposed Observatory. Mr. Peck visited the city, and made a careful examination of all the probable places on which the Observatory could be placed. It is understood that he has pronounced in favour of Balgay Hill as the best site in all the circumstances for the Observatory. The trustees are responsible for the erection of the building, and they have instructed Mr. Cappon, architect, to prepare plans.

IN connection with the annual report brought forward by the Housing of the Working Classes Committee of the London County Council with reference to the income and expenditure in respect of all working-class dwellings and lodging-houses owned by the Council, Major A. G. Boscawen, the chairman of the committee, stated that the question of enabling workmen to buy their own dwellings was under the consideration of the committee at the present time. He was very hopeful that that could be done by a scheme of co-partnership or in some other way, and above all things he was anxious to make the work of the committee a success without the intervention of party politics.

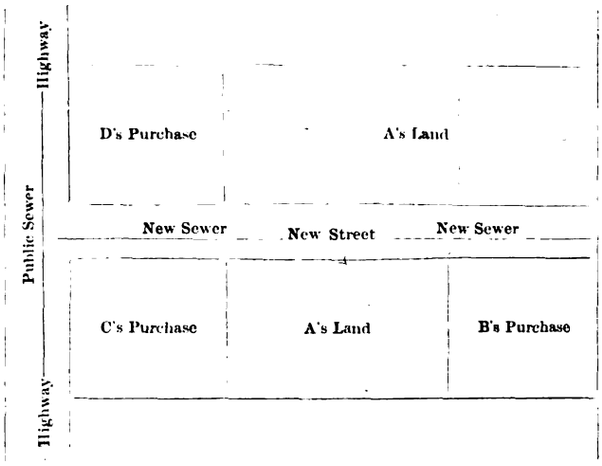
PROFESSOR BERESFORD PITE, F.R.I.B.A., delivered on July 22 the second of his series of lectures on architectural education, in the Lecture Theatre, Royal College of Science, St. Stephen's Green, Dublin. The lectures are under the auspices of the Department of Agriculture and Technical Instruction. The title of the lecture was "The Study of Architecture as a Constructive Art." Professor Pite showed the interesting nature of the mechanical aspects of ancient practice in architecture by means of numerous photographs of Greek and Roman works. He traced the evolution of the characteristics of the Gothic style from purely engineering necessities. The artistic quality of good construction, per se, was emphasised. Modern needs in construction and sanitation and the scope of scientific inquiry into materials and forces were explained.

SIR GEORGE MACRAE, vice-president of the Local Government Board, has been using his influence with the Board of Admiralty as to the drainage scheme for Rosyth, and as the result of a conference which he has had with the Sea Lords in London he intimated to Provost Husband, Dunfermline, that he has a new proposal to submit; that Dunfermline Corporation and the Admiralty should be the only partners in the scheme, thus leaving Dunfermline district committee, Inverkeithing Town Council, and Lord Elgin and the other superiors out altogether. With this object in view, it is believed that the Admiralty have agreed to contribute half of the capital cost of the scheme—at least 50,000*l.*—leaving Dunfermline to provide the other half.

THE old lighthouse at Pakefield, near Lowestoft, has recently been moved back about 100 yards owing to the erosion of the coast at this point. The framing and outside covering are of iron, whilst inside there are brick divisional walls and plaster ceilings. The complete building, which weighs sixty to seventy tons, was moved bodily upon a cradle constructed for moving Lowestoft Low Light, the haulage being effected by a crab. Of course, this is a modest exploit compared with what is done in the United States.

SEVERAL memorials and communications have been received by the City Council from East Birmingham in favour of immediate application of the provisions of the Town Planning Act to the portion of Saltley, Washwood Heath, and Ward End not already built on. A numerous and representative deputation from that part of the city, urging the importance of immediate action, has also been received. Having discussed the matter fully the general purposes committee recommend the Council to give the necessary authority for serving notices and taking the other steps required under Parts 1, 2 and 3 of the Local Government Board Regulations, preliminary to an application for power to make a scheme in respect of an area of about two square miles, which is bounded on the north by the Midland Railway and the river Tame, on the east by Bromford Lane and the river Cole, on the south-east by the river Cole, on the south by the Spark Brook, and on the west by an irregular line.

LEGAL QUERY.



A OWNED a field bounded at one end by a public highway; in the centre of such highway the Corporation of the place had a public sewer. A prepared a plan (above) showing a street in the centre of his field and building sites at each side of such street.

A's first sale was to B, and in the conveyance there was a stipulation that B was to pay to A half the cost of constructing, maintaining and cleansing the street *and sewer* so far as they adjoin his purchase, until they were taken over by the Corporation.

C and D afterwards bought plots (shown on plan above). In their conveyances is a stipulation that they pay A half the cost of making, maintaining and cleansing the street until taken over by the Corporation; but the *street* only is mentioned, *no mention* being made of *sewer*.

B demanded that A construct street and sewer. A complied, ascertained the cost of street and sewer, which was 30*s.* per lineal foot, and demanded 200 times 15*s.* (half cost of full width of street and sewer) from B, B's frontage being 200 feet in length. B does not object. B's intended houses could not be drained without the new sewer made by A.

A demands 100 *times* 15*s.* (100 feet being the length of their respective frontages *to the new street*) from C and D. C and D decline to pay anything on account of *sewer*, contending that the stipulation in their conveyances renders *them* liable for their contribution to street-making only and not for street and sewer. C and D can both drain into the public sewer and need not use the new sewer made by A.

Can A compel C and D to contribute to cost of sewer, or can he only recover their proportion of street without sewer from them? PERPLEXATUS.

ANSWER.

SEWER (Perplexatus).—A cannot compel C and D to contribute to the cost of the sewer.

TRADE NOTES.

THE St. Thomas's Old Boys' School, Exeter, is being ventilated by means of Shorland's patent ridge ventilators and patent hygienic inlet panels supplied by E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

Page's Weekly, an illustrated journal of engineering, shipbuilding, and the iron and steel trades, has been improved considerably, and the issue of July 22 contains an interesting article on "The Chemical and Mechanical Relations of Iron Manganese and Carbon," by Professors J. O. Arnold and A. A. Read.

THE architect for the new town hall to be erected at St. Germans, Cornwall, is Mr. J. Sansom, of Liskeard.

NEW baths, at a cost of about 12,000*l.*, will be erected at King's Norton for the King's Norton Urban Council.

HAMMERSMITH Workhouse, which cost about 250,000*l.* to complete, is now insufficient to accommodate the local paupers, and a proposal is being made to enlarge it.

AN Order in Council has been issued permitting the Ecclesiastical Commission to make a mortgage loan of 2,000*l.* on the usual terms to the Bishop of Norwich with a view to his carrying out alterations and improvements at the Palace.

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ASSOCIATION OF CONSULTING ENGINEERS.

ON Wednesday, July 13, a meeting, presided over by Sir William Preece, K.C.B., F.R.S., was held at Caxton Hall to consider the desirability of forming an Association of Consulting Engineers, the object of the Association being to improve the status of the profession and to place it on a more satisfactory basis than hitherto.

Invitations had been issued to a number of consulting engineers, at the instance of a provisional committee, and the invitation was signed on behalf of this committee by the following members:—

Representing Civil Engineering:—Messrs. W. T. Douglass, E. L. Mansergh, Midgley Taylor, and Henry Rofe.

Representing Electrical and Mechanical Engineering:—Messrs. B. M. Jenkin, W. M. Mordey, Llewellyn Preece, and James Swinburne.

Representing Gas Engineers:—Messrs. C. G. Hunt and E. H. Stevenson.

Mr. A. H. Dykes, as hon. secretary of the provisional committee, read letters of regret at their inability to attend the meeting from Messrs. Charles Bright, E. M. Lacey, C. Hunt, H. Humphreys, W. H. Patchell, C. P. Sparks, W. T. Douglass, H. Rofe, and J. F. C. Snell, all of whom expressed themselves as being heartily in sympathy with the objects of the meeting.

Mr. Midgley Taylor, who presided at the opening of the meeting pending the arrival of Sir William Preece, who was detained, said that the object of calling the meeting was to form an Association of Consulting Engineers. The subject had been before several consulting engineers for the past two years or more, and as some initial step had to be taken, the members who originally took the subject up formed themselves into a provisional committee and had held a large number of meetings, with the result that the present meeting had been called to confirm, or otherwise, the action taken by the committee in the past. The object of the meeting was to see whether the general idea of the formation of the Association met with the approval of consulting engineers in this country. Everyone knew that quite recently the Institution of Civil Engineers had helped the consulting engineer to the best of their ability by forming rules for professional conduct, and he was sure that every engineer would feel that that was a step in the right direction. He had no doubt that from the point of view of the Council of the Institution of Civil Engineers they (the Council) had gone as far as that body could go. He thought the membership of the Institution was something approaching 10,000; probably the regular consulting engineers in this country were not 5 per cent. of that body, and therefore the self-appointed committee considered that the Council of the Institution could not, in the very nature of things, give all the protection that was desirable for the consulting engineer. He wished to emphasise the point that the committee had not been working in any antagonism to the Institution of Civil Engineers, but had been endeavouring to go one better than was possible for that body. He felt that the public wanted protecting. At the present time, if municipal authorities erected works, even of large magnitude, they were not compelled to employ a qualified man to advise them, and there was nothing to prevent an absolutely unqualified man going to the particular authority, touting for the work, and being employed. Under those circumstances he felt they should endeavour to form an Association such as would not only protect themselves, but would also protect the various public bodies and persons in this country who were anxious to get a properly qualified man to advise them on engineering works. He felt that those unqualified men who endeavoured to take the work out of one's hands, even after the appointment had been made, should not have the standing that would belong to the members of a body such as it was proposed to form. The committee hoped that the meeting would result in the formation of the Association, but at the same time they wanted to have an open expression of opinion from everyone, whether they were favourable or otherwise. He then called upon Mr. James Swinburne (who had interested himself in the movement from the very beginning) to propose the formation of the Association.

Mr. James Swinburne formally proposed that the Association be formed at once, but he first wished to say that the self-appointed committee had met with many difficulties. First, there was an idea that there was some antagonism between the proposed Association of Consulting Engineers and the Institution of Civil Engineers and other institutions. The only thing that a body like the Civil Engineers could do was to frame rules of etiquette which were very good things in themselves, but which really limited the powers of the genuine consulting engineer rather than helped him. It was, therefore, necessary that consulting engineers should work in sympathy with the Institution of Civil Engineers and other institutions, and that they should, in addition, form an association themselves, not for the purpose of technical papers, but purely to guard the interests of consulting engineers as such, and of the public in so far as the latter were bound up with the interests of the consulting engineer. The great difficulty in forming an association was that people were apt to split over small differences of opinion. He therefore asked the meeting to look at the matter as broadly as possible, and not to consider whether any particular rule interfered with their own ideas. He also urged the older members of the consulting profession not to stand aloof because they were in a position sufficiently independent not to be affected by the malpractices of those who were not genuine consulting engineers. By lending their names to the movement they would be helping the younger consultant, who was the man to be looked after. As to the rules that had been circulated, the idea was not to adopt them immediately. All they could do was to say whether they were going to have an Association of Consulting Engineers or not. If they were, then they had to appoint something—a temporary committee or something of that sort—to which the details of formation and rules of the Association could be handed over for consideration to be finally approved by the members of the Association. In the case of this first meeting it was obviously impossible to make the list of invitations as complete as the committee would desire. It was hoped that any who had not yet been communicated with would understand that the Association was intended to cover the broadest possible field consistent with its objects, and that those corporate members of the Institution of Civil Engineers who were practising purely as consulting engineers, would, by sending in their names, assist the Secretary in compiling his list of membership for submission to the committee.

The motion having been seconded by Mr. E. L. Mansergh, a general discussion took place.

Mr. E. H. Stevenson remarked that he only wished such an Association had been started twenty or thirty years ago, and although it might not now affect the older members like himself, it would be of very great assistance to the younger consulting engineers. Mr. Robert Hammond dwelt upon the importance of such an Association from the public point of view. Although a private company was quite at liberty to have work carried out in any way that might seem desirable, in the case of municipal work it became highly desirable that public money should be spent only under the guidance of properly qualified engineers. A good deal of the discussion turned upon the question of the name of the Association. Thus, Mr. A. H. Preece, whilst expressing on behalf of his firm entire accord with the step that had been taken, thought that a committee might be sufficient without any formal Association. On the other hand, Mr. Swinburne, Mr. Midgley Taylor, Mr. Lowcock, Mr. Hammond, and others were strongly in favour of an Association with a Council, owing to the fact that such a body would carry more weight with Government officials, courts of law, and the general public. Mr. W. M. Mordey saw no objection to the formation of an Association from the point of view of adding to the already long list of societies, because its functions would be very different from those of the ordinary society. He was of opinion that a great deal depended upon the selection of a suitable name, and he thought it would be best to call the society an Association.

There was also some discussion as to whether the term "consulting engineer" was altogether the best to be adopted in the name of the Association. Mr. Druitt Halpin thought it was undesirable, but other speakers thought it was difficult to substitute any other term. Mr. A. P. I. Cotterell asked whether the Institution of Civil Engineers were in favour of the scheme, as otherwise the Association might come in conflict with the Institution sooner or later, which would be highly undesirable. In reply to this question, Mr. A. H. Dykes said that he had received a letter of a most sympathetic nature from the Secretary of the Institution of Civil Engineers.

The formation of the Association was also supported briefly by Mr. Campbell Swinton, Mr. B. M. Jenkin, and Mr. H. W. Handcock.

Sir William Preece, who had arrived during the discussion and had taken the chair, said he was entirely in sympathy with the movement. Most of the discussion had been on the question of the name, which was not very important at the moment. He assured them of the sympathy of the Institution of Civil Engineers, and he was sure that the committee of the Association would be received heartily by the Council in the discussion of any points that might arise. What they wanted

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was to band themselves together as brothers in a similar profession with a very strong committee and strong chairman. He then put the resolution, that the Association be formed, to the meeting, and declared it to be carried unanimously.

The Chairman then read the list of names of the suggested committee, the names being as follows:—

As representing Civil Engineering:—Baldwin Latham, S. R. Lowcock, E. L. Mansergh, Henry Rofe, and Midgley Taylor.

Electrical and Mechanical Engineering:—Messrs. Robert Hammond, B. M. Jenkin, W. M. Mordey, W. H. Patchell, Sir William Preece, J. F. C. Snell, James Swinburne.

Gas Engineering:—Messrs. C. Hunt, E. H. Stevenson, and Henry Woodall.

No further names being forthcoming, the committee were elected as above, with power to add to their number, to take what steps they considered desirable for the formation of the Association, and to formulate rules to be submitted to a general meeting to be called in the autumn.

Mr. B. M. Jenkin explained the lines on which a code of rules had been drawn up by the provisional committee, and placed them formally at the disposal of the new committee. The committee drew up a set of rules which they handed to the Institution of Civil Engineers for consideration. There was a proposal at that time that the Institution might distinguish in their list of members between those acting as consultants and others, but the Council were not prepared to do so. The object of the rules was to define what a consulting engineer was, and one of the objects of the Association was to make all consultants join together and work together along definite professional lines. That was extremely difficult, as one could only define a consulting engineer by saying what he could or could not do, but it was hoped that the rules would define pretty clearly what he might or might not do, and would be a help to young consultants as to what their professional conduct should be, and teach the public what a consulting engineer is. The idea was to print the rules with a list of members, so that anyone who wished to obtain a consulting engineer could consult the register. The rules were not complete, or in their final form, but were issued primarily with a view to discussion later.

Mr. James Swinburne proposed the election of Mr. A. H. Dykes as hon. secretary, reminding the meeting that the success of the matter was entirely due to him, and this was seconded and carried unanimously.

Mr. Dykes responded briefly in accepting the position, and the meeting terminated with a vote of thanks to Sir William Preece for presiding.

The hon. secretary of the Association is Mr. A. H. Dykes, of 1 Victoria Street, Westminster, S.W.

NATIONAL HOUSING AND TOWN PLANNING COUNCIL.

A CONFERENCE on the working of the Housing and Town Planning Act, 1909, attended by upwards of 200 representatives of local authorities, architects, and others, was held on Tuesday last at the Westminster Palace Hotel under the auspices of the National Housing and Town Planning Council, of which Mr. H. R. Aldridge is secretary. The chair was taken by Mr. Hickson, the town clerk of Rochdale, who said that they had met to consider the regulations made by the Local Government Board under Section 56 of the Housing and Town Planning Act, which in their character are somewhat disappointing, and to suggest modifications so as to make the Act as useful as it can be made in the various localities.

The first resolution—"That this Conference, valuing very highly the powers given to local authorities by the Housing and Town Planning Act, 1909, and recognising that the wise and active administration of the town planning clauses will be of national service, desires to draw the attention of the Local Government Board to the great need for modifying the regulations governing the administration of the town planning clauses, and more especially those regulations which prescribe the procedure for enabling a local authority to obtain permission to prepare a scheme"—was proposed by Mr. Horsfall, of Manchester, seconded by Mr. Edwin Hall, and carried after a discussion which was taken part in by Mr. Councillor Galbraith, Mr. Councillor Jacobs, of Plymouth, the Town Clerk of Nottingham, and Councillor Holmes, of Gillingham.

The second resolution was that "This Conference desires to make the following suggestions in regard to such modification:—(*a*) That in view of the fact that the information which under Article 6 must be forwarded to the Local Government Board with the application for permission to prepare a scheme cannot be prepared without actually making a scheme, Article 6 should be deleted from the regulations; and that for the same reason the following words in Article 8 (*e*), 'Such information as the local authority may be in a position to give in regard to the extent to which it would be necessary to provide for the demolition or alteration of the buildings for the purpose of carrying the scheme into effect,' and the following words in Article 8 (*f*), 'as to the manner in which they would be affected,' should also be deleted. (*b*) That the estimate required under Article 10 in connection with the application to prepare a scheme should be restricted to the cost of preparation only. (*c*) That in the case of a scheme prepared by a landowner or landowners for approval, and which has been adopted by a local authority, the procedure should be greatly simplified. (*d*) That the provisions of Article 3 should be restricted to the land proposed to be included in the scheme in such a way as to render the consideration of the scheme in detail unnecessary. (*e*) That the requirements of Article 8 (*d*) should not be imposed except as part of Article 14; and (*f*) that the notices referred to in Article 1 should not be required to be served upon occupiers."

This was proposed by Mr. Councillor Marr, of Manchester, seconded by Mr. Alderman Brearley, of Halifax, and carried after a lengthy discussion on the various clauses which was taken part in by Mr. Cotton (Epsom), Mr. Hooper (Cardiff), Mr. Edwin Hall, Mr. Ash (Coventry), Mr. Creswell (Carshalton), and others.

Resolution No. 3, that "This Conference instructs the Advisory Committee to appoint a deputation to submit the resolutions passed at this Conference to the President of the Local Government Board," was also carried after a discussion which was taken part in by Mr. Galbraith, Dr. Freemantle, and Dr. Lawrence.

The Secretary then made some remarks on the cost of carrying the town planning scheme into effect; and after some discussion on this point the proceedings concluded with a hearty and unanimous vote of thanks to the chairman.

INCORPORATED SOCIETY FOR PROMOTING THE ENLARGEMENT, BUILDING AND REPAIRING OF CHURCHES AND CHAPELS.

THIS Society held its usual monthly meeting on Thursday, July 20, at the Society's House, 7 Dean's Yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. There were also present the Revs. Canon J. Erskine Clarke, A. G. Ingram, C. F. Nolloth, Litt.D., W. B. L. Hopkins, and Prebendary R. Digby Ram; Sir W. E. M. Tomlinson, Bart., the Hon. E. P. Thesiger, C.B., Mr. George Cowell, F.R.C.S., Mr. L. C. Wakefield, and the Rev. T. T. Norgate, Secretary.

Grants of money were made in aid of the following objects, viz.:—Building new churches at Bishopwearmouth, St. Gabriel, Co. Durham, 200*l.*; Grimsby, St. Augustine, 150*l.*; Pontyates, near Kidwelly, Carms., 75*l.*; and West Streatham, St. James, Surrey, 175*l.*; rebuilding the churches at Caerwent, St. Stephen, Monmouth, 40*l.*; and New Ferry, St. Mark, Cheshire, 100*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Cockfield, St. Mary, Co. Durham, 60*l.*; East Thorpe, St. Mary, Essex, 50*l.*; Harlton, St. Mary-the-Virgin, Cambs., 25*l.*; Ilford, St. John the Evangelist, Essex, 25*l.*; Windermere, St. Martin, Westmoreland, 30*l.*; York, St. Luke, 150*l.*; and Chesham Bois, St. Leonard, Bucks, 55*l.* Grants were also made from the special Mission Buildings Fund towards building mission churches at Bow, Devon, 20*l.*; Bowburn, Co. Durham, 30*l.*; Carlton Vale, Kilburn, Middlesex, 25*l.*; Furzedown, Surrey, 50*l.*; Grimsby, St. Hugh, 40*l.*; Rodley, near Leeds, 20*l.*; Stockwell, The Epiphany, Surrey, 50*l.*; and The Brook, Chatham, 30*l.* The following grants were also paid for works completed:—Longsight, St. Anne, Lancs., 200*l.*; Llandrindod Wells, Holy Trinity, 50*l.*; Plymouth, St. Gabriel, 120*l.*; Birmingham, St. Patrick, 50*l.*; Port Talbot, St. Agnes, Glam., 85*l.*; Cricklewood, St. Michael, Middlesex, 150*l.*; North Sheen, St. Peter, Surrey, 40*l.*; and Barnt Green, St. Andrew, Worces., 25*l.* In addition to this the sum of 580*l.* was paid towards the repairs of seventeen churches from trust funds held by the Society. The Society likewise accepted the trust of sums of money as repair funds for the churches at Highampton, Devon, and Frocester, Glos. At this meeting it was announced that a donation of 1,000*l.* had been received from Mr. Richard Foster, a vice-president of the Society.

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Cathedrals and Abbeys of England—continued.

BRISTOL—*continued.*

Plan	October 6, 1899
East Side Cloisters	October 6, 1899
From Road looking South-East	October 6, 1899

WELLS.

Nave looking East	October 13, 1899
West Front	October 20, 1899
Detail of Front and West Door	October 20, 1899
Looking North-West from Wells	October 27, 1899
Choir looking East	October 27, 1899
North Porch and Tower	November 3, 1899
From Lady Chapel looking West	November 3, 1899
Looking North-East from Burial-ground	November 10, 1899
Details North Porch	November 10, 1899
Hugh Lugar's Chantry and South Aisle	November 17, 1899
The Triforium	November 24, 1899
The Lady Chapel	December 1, 1899
Bishop Bubwith's Chantry	December 8, 1899
Clock in North Transept	December 8, 1899
Steps to Chapter-house and Bridge	December 15, 1899
Tomb of Henry Husee, Dean 1302-05	December 15, 1899
Doorway, Chapter-house	December 22, 1899
View of Chapter-house, looking North-West	December 22, 1899
Section of Chapter-house	December 22, 1899
Bridge to Vicars Close	December 29, 1899

WESTMINSTER ABBEY.

Sixty Years Ago	January 5, 1900
Choir, looking East, Part North Transept	January 5, 1900
Entrance South Ambulatory	January 5, 1900
Triforium, North Transept	January 5, 1900
Tower and Buttresses from Cloisters	January 12, 1900
The Triforium	January 12, 1900
Choir looking East, Part South Transept	January 19, 1900
North Door	January 19, 1900
Transept looking North-East	January 26, 1900
Triforium, North Side of Sacrarium	January 26, 1900
Details North Porch	January 26, 1900
From South Transept looking North-East	February 2, 1900
North Ambulatory looking towards Henry VII.'s Chapel	February 2, 1900
Poets' Corner	February 2, 1900
Triforium, South Transept	February 9, 1900
North Side of Cloisters	February 9, 1900
Part Old Arcade, Chapel St. Edmund	February 9, 1900
Interior looking East Modern Screen	February 16, 1900
Details North Porch	February 16, 1900
South Ambulatory looking towards Henry VII.'s Chapel	February 23, 1900
North Ambulatory looking East	February 23, 1900
Abbot's Courtyard	February 23, 1900
Deanery and Corner of Cloisters	February 23, 1900
Bishop Islip's Chantry in North Ambulatory	March 2, 1900
Monks' Common Room	March 2, 1900
Crypt under Chapter-house	March 2, 1900
Chapel of St. Edmund, looking North-East	March 9, 1900
Entrance to Cloisters looking Dean's Yard	March 9, 1900
Tomb of Edward III.	March 9, 1900
Chapel St. John Baptist	March 16, 1900
View showing Porch	March 16, 1900
Bronze Gates	March 16, 1900
Cloisters and End South Transept	March 23, 1900
Entrance to Chapter-house	March 23, 1900
Shakespeare Memorial	March 23, 1900
Ambulatory to Henry VII.'s Chapel	March 30 1900
Doorway in Chapter-house	March 30, 1000
Arcade in Chapter-house	March 30, 1900
Chapel of St. Nicholas	April 6, 1900
Reredos from Confessor's Chapel	April 6, 1900
North Side, Confessor's Tomb	April 13, 1900
Abbot's Pew	April 13, 1900
North-East Side Confessor's Tomb	April 13, 1900
Chapel St. Edmund, looking North-West	April 20, 1900
Chapel of Pyx	April 20, 1900
Entrance to Little Cloister	April 20, 1900
Modern Reredos	April 27, 1900
Doors of Chamber of Pyx	April 27, 1900
Ancient Norman Capital	April 27, 1900
Tombs in Sacrarium	May 4, 1900
Gateway to Chapter-house	May 4, 1900
East Cloisters	May 4, 1900
Triforium, North Transept	May 11, 1900
End of Tomb of Henry VII.	May 11, 1900
Confessor's Shrine from North-West	May 11, 1900
Henry V.'s Chantry	May 18, 1900
Details	May 18, 1900
Tomb, Henry VII. and Queen Elizabeth	May 18, 1900
From Playground	May 25, 1900
Showing Tower and Roadway	May 25, 1900
Details of Stalls	June 1, 1900
Exterior	June 1, 1900
South Aisle	June 8, 1900
South Aisle looking West	June 8, 1900
Henry VII.'s Tomb	June 15, 1900
Henry VII.'s Tomb nd Chapel	June 15, 1900
Monuments of Duc de Montpensier	June 22, 1900
Showing Pendentive, &c.	June 22, 1900
Corner of Little Cloisters	June 29, 1900
Jerusalem Chamber	June 29, 1900
Figure, Mary Queen of Scots	June 29, 1900
Wilberforce Monument	June 29, 1900
Ground Plan	June 29, 1900

LICHFIELD.

Choir looking West	July 6, 1900
Nave looking East	July 13, 1900
West Doorway	July 20, 1900
View from West	August 10, 1900
West Front	August 17, 1900
Part Lady Chapel	August 24, 1900
South Door	August 31 1900
East End	August 31, 1900
North Transept Door	August 31, 1900
Portion of West Front	September 7, 1900
North Side of Nave	September 14, 1900
From Cathedral Close	September 21, 1900
Choir and Reredos	September 21, 1900
South Side of Nave and South Transept	September 21, 1900
Lady Chapel	September 28, 1900
From Minster Roof	October 5, 1900
South Choir Aisle	October 12, 1900
Showing Minstrel Gallery	October 19, 1900
Entrance to Chapter-house	November 2, 1900
The Reredos	November 30, 1900
The Transepts, looking North	December 7, 1900
North Nave Aisle, looking East	December 14, 1900
Detail of Corner of Front	December 14, 1900
One of the smaller West Doors	December 14, 1900
The Chapter-house Entrance	December 28, 1900
The Chapter-house Passage	December 28 1900
View in South Transept	December 28, 1900
Looking to Nave	December 28, 1900
Ground Plan	December 28, 1900

YORK.

General View of Exterior from South-East	January 4, 1901
General View from North-west	January 11, 1901
Detail of South-west end of Front	February 1, 1901
The Nave, to Organ Screen	February 8, 1901
View in North Transept, showing Clock and Triforium Windows	February 15, 1901
The Choir, half-length	February 22, 1901
From South-West	March 1, 1901
South Nave Aisle, looking East	March 8, 1901
South Choir Aisle, looking West	March 15, 1901
Entrance to the South Choir Aisle	March 22, 1901
The Choir to Organ Screen	March 29, 1901
The Great Stone Screen	April 5, 1901
View across Nave to North Transept	April 5, 1901
Detail of Nave Arches	April 12, 1901
Detail of Arcading under West Window	April 12, 1901
The Choir, full length to East Window	April 19, 1901
The Lady Chapel	April 26, 1901
Cross View to Nave from South Transept	May 3, 1901
View across Nave to South Transept, showing Font	May 10, 1901
The South Door	May 10, 1901
West End of Nave	May 17, 1901
West End of South Nave Aisle	May 31, 1901
South Choir Aisle, half length	June 7, 1901
The Chapter-house	June 21, 1901
The Chapter-house Door	June 28, 1901
Details in Chapter-house	June 28, 1901

CHICHESTER.

From St. Richard's Walk	July 5, 1901
The Screen and Choir	July 12, 1901
View from North-East	July 19, 1901
South Transept	July 26, 1901
Triforium, South-West Tower	August 2, 1901
Looking up the South-West Tower	August 2, 1901
Window Tracery, South Transept and Lady Chapel	August 9, 1901
Capitals, South Choir Aisle	August 16, 1901
Inside the Triforium looking West	August 23, 1901
South-West corner of Nave	August 30, 1901
East End of North Aisle	September 6, 1901
East Cloister and South Aisle	September 13, 1901
North Aisle, Looking West	September 20, 1901
Tower and South Transept	September 27, 1901
Ancient Sculpture in Wall of South Choir Aisle	October 4, 1901
The Raising of Lazarus	October 4, 1901
East End of Retro-Choir	October 18, 1901
The Lady Chapel	October 18, 1901
Cloisters and South-west Tower	October 18, 1901
Tower and East End of Choir	October 25, 1901
Triforium, North-east Corner of Retro-Choir	October 25, 1901
Chapel of St. Clement	November 1, 1901
Looking into South Aisle of Nave	November 1, 1901
One Bay of Nave Triforium	November 1, 1901
North Transep and Campanile	November 15, 1901
South Door in Cloisters	November 15, 1901
East End of South Cloister	November 15, 1901
Triforium, &c., from West Window	November 22, 1901
West End of South Aisle	November 22, 1901
The Reredos	November 29, 1901
The Library	November 29, 1901
East End of Lady Chapel	December 6, 1901
West End of Lady Chapel	December 6, 1901
The Nave	December 13, 1901
Nave Arches	December 13, 1901

RIPON.

General View of Exterior from South-East	January 3, 1902
The Choir to East Window	January 17, 1902
The Nave, looking West	January 31, 1902
General View, from the River	February 14, 1902
The Three Stone Sedilia	March 7, 1902
The Rood-Screen between Nave and Choir	March 28, 1902

RIPON—*continued.*

The South Nave Aisle, looking East	April 4, 1902
he Choir, looking West	April 18, 1902
View of the South Side of Nave	May 2, 1902
North Side of the Nave, showing Double Buttresses	May 2, 1902
General View of Nave to Organ Screen	May 16, 1902
Portion of North Transept, showing Old Stone Pulpit	June 6, 1902
The South Transept	June 6, 1902
The West Front	June 13, 1902
The West Entrance	June 13, 1902
South Choir Aisle, looking West	June 27, 1902

HEREFORD.

View from North-West	July 4, 1902
View from South-East	July 11, 1902
View from North-East	July 18, 1902
Nave Arches, North Side	July 25, 1902
South Aisle, looking East	August 1, 1902
From South Aisle, looking into North Transept	August 1, 1902
East End	August 8, 1902
South Side of Lady Chapel	August 8, 1902
North Porch	August 15, 1902
South Transept and Cloisters	August 15, 1902
The Nave	August 22, 1902
East End of South Choir Aisle	September 5, 1902
The High Altar	September 5, 1902
The Retro-Choir	September 19, 1902
In South-East Transept	September 19, 1902
The Choir Screen	October 10, 1902
From North Choir Aisle, looking South-East	October 17, 1902
The Cloisters and the Ladye Arbour	November 7, 1902
The Vicars' Cloisters	November 7, 1902
Looking into North Transept	November 14, 1902
East Wall of North Transept	November 21, 1902
The North Door	November 28, 1902
A Coffin Lid	November 28, 1902
East Wall of South Transept	December 5, 1902
Ball Flower Ornament on Tomb in North-East Transept	December 12, 1902
Four-Leaved Flower Ornament on Tomb in North noir Aisle	December 12, 1902
Corner of North Transept	December 19, 1902
Gargoyle in Cloisters	December 19, 1902
North Wall of Lady Chapel	December 26, 1902
Diaper Work and Capitals in North Transept	December 26, 1902

WORCESTER.

From North-East	January 2, 1903
The Choir, looking West	January 9, 1903
South Transept and Tower	January 16, 1903
Cloisters and Tower	January 23, 1903
The Nave	January 30, 1903
East End of Prince Arthur's Chantry. Details of Prince Arthur's Chantry	February 6, 1903
Looking North-West across the Nave	February 13, 1903
Entrance to Cloisters. Bosses in Cloister Vaulting	February 20, 1903
Capitals in South Transept. The Crypt	February 27, 1903
The High Altar	March 13, 1903
Nave Arches and North Transept	March 27, 1903
The West Door. The North Porch	April 10, 1903
From Lady Chapel, looking into South-East Transept	April 17, 1903
Chapel of St. John	May 1, 1903
Cloisters and South Transept	May 15, 1903
Looking into North Transept	May 29, 1903
South-East Transept	June 19, 1903
Looking into Lady Chapel	June 19, 1903
The Screen and Choir	June 19, 1903
North Cloister	June 26, 1903
The Chapter-House	June 26, 1903
South Door in Cloisters	June 26, 1903

EXETER.

The West Front	July 3, 1903
The Choir, looking East	July 10, 1903
The Choir Screen	July 17, 1903
The North Tower and North Porch	July 24, 1903
The Nave, looking West	July 31, 1903
Window Tracery, North and South Side of Choir	August 7, 1903
View from South-East	August 14, 1903
Details of West Front	August 21, 1903
Chapter house and Cloisters, South Tower, from Palace Garden	September 4, 1903
Sylke's Chantry and Chapel of St. Paul	September 11, 1903
West End of Lady Chapel	September 25, 1903
South Aisle, looking East	October 9, 1903
South Aisle	October 16, 1903
Nave Vaulting	October 23, 1903
Speke Chantry, and Chapel of St. Mary Magdalene	October 30, 1903
St. Gabriel's Chapel and End of Bishop Oldham's Chantry	November 6, 1903
North Transept and Clock	November 13, 1903
Nave, looking East	November 20, 1903
The Nave Arches	November 27, 1903
Chancel, and Screen to North Aisle	December 4, 1903
East End of Lady Chapel	December 11, 1903
The Choir	December 18, 1903
High Altar and Sedilia	December 25, 1903

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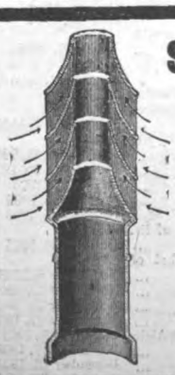
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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

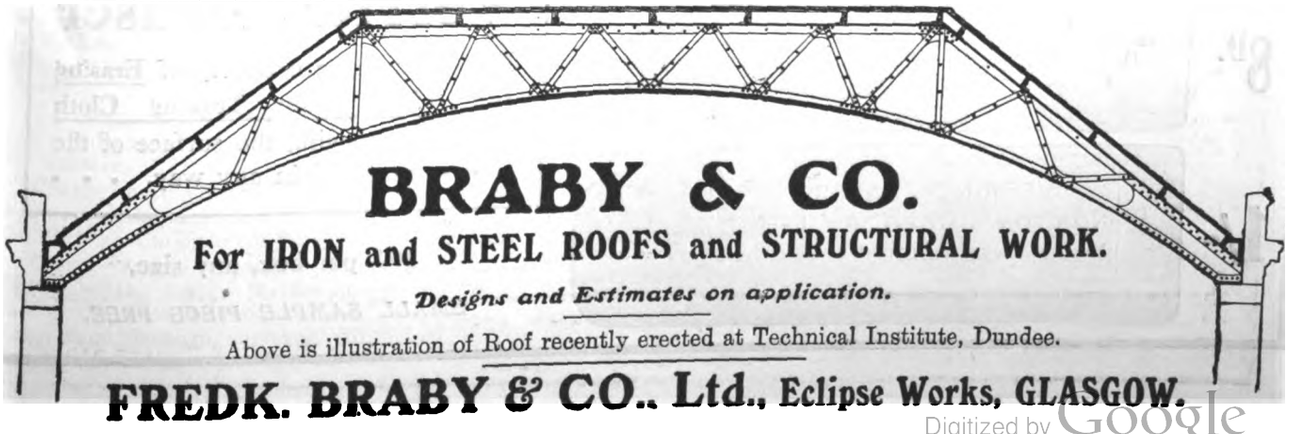
ANTWERP.—Oct. 1.—An international competition is being arranged for a scheme for the laying out of the land surrounding Antwerp, which will shortly be available by the demolition of the encircling fortifications. Premiums of 1,000*l.*, 400*l.*, and 200*l.* are offered. Copies of the conditions, &c., may be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C., or, on payment of 100 francs from the "Commission d'études de l'aménagement de l'agglomération anversoise," 57 Rue du Jardin des Arbalétriers, Antwerp.

BELFAST.—Sept. 15.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of *bona-fide* design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

EGYPT.—Aug. 24.—The Egyptian State Railways Administration propose to hold a limited competition for a new railway passenger station at Alexandria. Architects desirous of taking part in the competition should make application to the Director-General of the Egyptian State Railways, Cairo, not later than noon on August 24, giving information as to their status as architects and a list of the constructions for which they have prepared plans during the last three years. Six architects will be finally permitted to compete. Prizes of 400*l.*E, 200*l.*E, and (two of) 100*l.*E will be awarded for the best plans.

FOLKESTONE.—Sept. 10.—Designs are invited for a secondary school to accommodate 150 boys. Deposit 2*l.* 2*s.* Mr. A. F. Kidson, town clerk, Folkestone.

GORLESTON-ON-SEA.—August 31.—The Governors of the East Anglian Institution for Blind and Deaf Children invite plans and designs for a new building to be erected at Gorleston-on-Sea. The competition will be confined to architects having



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an office or residing in the areas of the following education authorities:—Cambridgeshire, Isle of Ely, Lowestoft, Norfolk, Norwich, East Suffolk, and Great Yarmouth. Copies of the instructions to architects within the prescribed areas will be sent on a remittance for 10*s.* (returnable). Documents to be sent back. Mr. D. O. Holme, clerk of the governors, Castle Chambers, Norwich.

IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

IRELAND.—Sept. 1.—The Kingstown Urban Council offer prizes of 50*l.* and 20*l.* for the best sets of plans for a Carnegie Library to be erected in Lower George's Street. Deposit 1*l.* 1*s.* Mr. J. Sherlock Vaughan, town clerk, Town Hall, Kingstown.

SCOTLAND.—The committee of Buckhaven Co-operative Society, Ltd., is prepared to receive competitive plans for proposed extension to bakery premises. Full particulars may be had from the Manager, Randolph Street, Buckhaven.

SHERINGHAM.—Sept. 5.—The Urban District Council invite designs for proposed new Council offices. Apply, enclosing a stamped and addressed envelope, to Mr. Edgar C. Rolfe, clerk, Church Street Chambers, Sheringham, Norfolk.

WALES.—Sept. 19.—The town hall committee invite competitive designs, &c., for the proposed alterations and additions (not exceeding in cost 3,000*l.*) to the town hall and market hall, Maesteg. Conditions, with a plan of site and sections at ground level, may be obtained from Mr. Samuel J. Harpur, engineer and surveyor, Town Hall, Maesteg. Two premiums are offered, namely, 25 guineas and 10 guineas, as first and second respectively. The committee do not bind themselves to award the premiums, and they do not intend to engage the authors of the designs for which premiums may be awarded to carry out or supervise the work.

CONTRACTS OPEN.

ASHFORD (KENT).—Aug. 8.—For the execution of summer repairs required to be carried out at the Brook Council school, for the Kent Education Committee. Mr. Wilfrid H. Robinson, architect, Caxton House, Westminster.

AYLESBURY.—Aug. 8.—For erection of a kitchen and scullery at the Isolation Hospital, Stoke Road. Deposit 10*s.* 6*d.* Mr. W. Harold Taylor, engineer and surveyor, Town Hall, Aylesbury.

ALDERSHOT.—Aug. 8.—For alterations and additions to the Wheatsheaf public-house, Church Lane. Messrs. Friend & Lloyd, architects, Grosvenor Road, Aldershot.

BINGLEY (YORKS).—Aug. 9.—The West Riding Education Committee invite whole or separate tenders for the following works, viz.:—Bath, laundry, gymnasium and engineering block for the new Training College at Bingley. West Riding Architect, County Hall, Wakefield.

BIRMINGHAM.—Aug. 10.—For the construction of about 325 yards of pipe sewer in Alum Rock Road, between the L. and N.-W. Railway and Treaford Lane. Deposit 1*l.* Mr. Henry E. Stilgoe, city engineer and surveyor, Birmingham.

BISHOP AUCKLAND.—Aug. 17.—For making alterations to wards and other rooms in the old infirmary at the Auckland Union workhouse, for the Guardians of Auckland Union. Mr. F. H. Livesay, architect, Bishop Auckland.

BOOTLE.—Aug. 8.—For alterations to two existing houses at Linacre Lane Storeyard, for the Corporation. The Borough Engineer, Bootle, Lancs.

BURNLEY.—Aug. 24.—For the erection of a new elementary school, to accommodate 300, at Hapton, near Burnley, for the Lancashire education committee. Deposit 2*l.*, returnable. Mr. Henry Littler, architect, 16 Ribblesdale Place, Preston.

CANTERBURY.—Aug. 8.—For certain alterations, painting, colouring and whitewashing work at the infirmary, for the Guardians. Mr. H. Doré, architect, 82 Castle Street.

CHRISTCHURCH (HANTS.).—Aug. 12.—For erection of an infirmary at the workhouse, Fairmile. Deposit 5*l.* Mr. A. Druitt, clerk, Christchurch, Hants.

CREWE.—Aug. 9.—For the erection of a public urinal at the Cumberland Bridge, Market Street, and for the setting back of the fence in Market Street. Deposit 1*l.* Mr. G. Eaton-Shore, borough surveyor, Municipal Offices, Earle Street, Crewe.

DARTMOUTH.—Aug. 10.—For refitting operating-room at the Cottage Hospital. Mr. W. Percy Marr, architect, Dartmouth.

DROXFORD.—Aug. 8.—For painting and general repairs to the buildings at the workhouse, for the Guardians of Droxford Union. Mr. H. Godfrey Pearson, clerk, Bishop's Waltham.

EASTBOURNE.—Aug. 8.—For the erection of a cottage at Roselands. Mr. Wm. Chapman Field, borough architect and building surveyor, Town Hall, Eastbourne.

EXETER.—Aug. 9.—For the extension of the verandah covering on the down side at Exeter (St. David's) Station, for the Great Western Railway Company. The Engineer at Paddington Station, London.

FRITTENDEN.—Aug. 10.—For the rebuilding of the Saunder's Cross Bridge, Frittenden, Kent. Mr. Frederick W. Ruck, county architect, 86 Week Street, Maidstone.

GREATHAM.—Aug. 20.—For the erection of a Council school for 120 children. Mr. W. J. Taylor, county surveyor, Winchester.

GRIMSBY.—Aug. 8.—For alteration of 31 and 33 Osborne Street. Messrs. H. Haagensen & Co., Old Custom House, Grimsby.

GUILDFORD.—Aug. 12.—For the slating and brickwork required for the new retort house at the Gasworks, Onslow Street. Deposit 1*l.* 1*s.* Mr. P. C. Cleasby, Gasworks, Guildford.

HALIFAX.—Aug. 25.—For the various trades in alterations to premises for branch bank, at the junction of Town Hall Street and Hollins Mill Lane, Sowerby Bridge, for the Halifax Commercial Banking Company, Ltd. Mr. Thos. Kershaw, A.R.I.B.A., architect, Lancs. and Yorks. Bank Chambers, Halifax.

HENBURY, NEAR BRISTOL.—Aug. 9.—For erection of a cottage at Henbury, near Bristol, for the Great Western Railway Company. The office of the Engineer at Bristol Station.

HIPPERHOLME (YORKS.).—Aug. 8.—For the plumber and tiler work required in erection of two villas at Hipperholme. Mr. Harry Smith, architect and surveyor, Holly Bank, Hipperholme.

HOLLYBUSH.—Aug. 10.—For erection of twenty or more houses at Hollybush, for the Hollybush Building Club. Mr. Allen H. Davies, architect and surveyor. Dock Street, Newport, or at the office of Mr. W. R. Phillips, Post Office Chambers, Pontllanfraith.

HORDEN COLLIERY.—Aug. 17.—For erection of a church at Horden Colliery, Durham. Deposit 3*l.* 3*s.* Messrs. Joseph Potts & Son, architects and surveyors, 57 John Street, Sunderland.

IRELAND.—For fixing "Mack" partitions and ceiling slabs. Apply to Sir John Keane, Cappoquin, Ireland.

IRELAND.—Aug. 13.—For extending the Crown Post Office premises at the Curragh Camp, Co. Kildare. Mr. H. Williams, Office of Public Works, Dublin.

IRELAND.—Aug. 17.—For the erection of additions to the County Court House, Nenagh, the cost not to exceed 900*l.* The County Surveyor, Court House, Nenagh.

KNYPERSLEY.—Aug. 23.—For erection and completion of a Council school for 350 children and a handicraft centre, at Knypersley, in the parish of Biddulph, Staffordshire. Deposit 1*l.* 1*s.* Mr. Graham Balfour, director of education, County Education Offices, Stafford.

LONDON.—Aug. 8.—For pulling down buildings in the Lower Richmond Road, Mortlake, and removing the material, for the Barnes Urban District Council. Mr. G. Bruce Tomes, A.M.I.C.E., engineer and surveyor, Council House, High Street, Mortlake.

LONDON.—Aug. 9.—For erection of a telephone exchange, Chiswick, W. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

MACCLESFIELD.—Aug. 15.—For the roofing of cattle pens, auction ring and fencing on Waters Green. Deposit 1*l.* 1*s.* The Borough Engineer's Office, Town Hall.

MACCLESFIELD.—Aug. 16.—For erection of new school buildings at the Grammar School, Macclesfield, available for 200 boys. Plans and specifications can be seen at the office of Messrs. Willink & Thicknesse, architects, 14 Castle Street, Liverpool.

MACCLESFIELD.—Aug. 23.—For erection and completion of a public elementary school building, play sheds, boundary fences and other works in connection therewith, on land in

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Byron Street. Messrs. Whittaker & Bradburn, architects, 19 King Edward Street, Macclesfield. Send 2*l.* 2*s.* deposit to Mr. Arthur T. Pattinson, clerk to the Education Committee, District Bank Buildings, Macclesfield.

Malmesbury.—Aug. 8.—For the repair of the Market Cross at Malmesbury, Wilts. Apply in writing to Mr. Harold Brakspear, F.S.A., architect, High Street, Corsham.

Market Rasen.—Aug. 6.—For carrying out various works required in alterations and additions to the Wesleyan ministers' houses. Mr. Walter Richardson, John Street, Market Rasen, Lincs.

Monaghan (Ireland).—Aug. 11.—For the following works, for the Joint Committee of the Monaghan Asylum, viz.:—(1) Repairs to gable of Protestant Church; (2) carrying out works in engine room and laundry, according to the specifications of Mr. W. A. Scott, architect, 45 Mountjoy Square, Dublin.

Nantwich.—Aug. 23.—For erection of seven single dwelling-houses and six sets of farm buildings on the Batherton Estate, near Nantwich, Cheshire. Deposit 1*l.* The County Estate Office, 49 Northgate Street, Chester.

Northfleet.—Aug. 13.—For the execution of summer repairs at the Northfleet Lawn Council school, Kent. Mr. Frederick Mitchell, correspondent, 49 Windmill Street, Gravesend.

Pensford.—Aug. 9.—For erection of a house at Pensford, near Bristol, for the Great Western Railway Company. The Engineer at Bristol Station.

Pontefract.—For the pulling down and rebuilding the Fox Inn, stables, &c., in Southgate, Pontefract, for Messrs. Beverley Bros., Eagle Brewery, Wakefield. Messrs. Garside & Pennington, architects and surveyors, Roper Gate, Pontefract and Castleford.

Pontefract.—For erection of six houses on Beechwood Estate. Messrs. Garside & Pennington, architects, Ponte-Pontefract and Castleford.

Ravensthorpe.—Aug. 10.—For the various works required in erection of eight houses in Huddersfield Road, Ravensthorpe, Yorks. Messrs. W. & D. Thornton, architects, Bond Street, Dewsbury.

Scotland.—Aug. 8.—For mason work of proposed bridge at Broxburn. Mr. T. Y. Ramsay, road surveyor, Bathgate.

Stafford.—Aug. 20.—The Staffordshire education committee are prepared to receive tenders for the supply of school furniture, for a period of one year. The Director of Educatio" (Requisitions Department), County Education Offices, Stafford.

Stannington.—Aug. 23.—For the foundation works and erection of twelve cottages at Stannington, near Morpeth, for the Committee of Visitors of the Gateshead Asylum Deposit 5*l.* Messrs. J. P. Allen & Partners, surveyors, Grainger Street West, Newcastle-on-Tyne.

Stone.—Aug. 23.—For erection and completion of combined cookery, laundry-work and handicraft centres, with class-rooms, &c., at Stone, Staffordshire. Send 1*l.* 1*s.* deposit to Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Sutton.—Aug. 13.—For ashlar portico and gallery staircases, new side entrance, and the pulling down and re-erecting of 200 yards of boundary wall at Baptist Chapel, Sutton, Yorks. Mr. F. W. Petty, architect, Woodridge, Cross Hills.

Swinton.—Aug. 10.—For supply of an iron staircase at the Pendlebury town hall, for the Swinton and Pendlebury Urban District Council. Mr. Henry Entwistle, surveyor of the Council, Swinton, Lancs.

Thirsk.—Aug. 12.—For the building of foundations for a wood and galvanised-iron fever hospital at Thirsk, Yorks., and laying on water supply and drainage from same. Mr. Thomas Stokes, architect, Thirsk.

Tow Law.—Aug. 10.—For the various works required in erection of six aged workmen's homes at North Road, Tow Law, Durham. The Mechanics' Hall, Tow Law.

Tring.—Aug. 8.—For alterations to the market house. Mr. S. S. Gettings, A.M.I.C.E., surveyor, Tring.

Twerton-upon-Avon.—Aug. 11.—For erection of a higher elementary school at Twerton-on-Avon, Somerset. Mr. A. E. Withy, 6 Northumberland Buildings, Bath, and Mr. A. J. Picton, architect, Bruton.

Wales.—Aug. 8.—For (1) repairing and putting in order the iron shutter at the entrance to the General Market; (2) mill stones at the Chapel Mill, for the Abergavenny Corporation. The Borough Surveyor, Abergavenny.

Wales.—Aug. 9.—For erection of branch premises, with house adjoining, at Victoria Village, Garndiffaith, for the Abersychan, British and Talywain Industrial Co-operative Society, Ltd. Mr. A. Gordon Babbidge, architect and surveyor, Clarence Chambers, Pontypool.

Wales.—Aug. 9.—For the extension of a goods shed at Abertillery, Monmouthshire, for the Great Western Railway Company. The Engineer at Newport Station.

Wales.—Aug. 9.—For erection of a villa at Maindy, Ton Petre. Mr. W. D. Morgan, M.S.A., 194 Ystrad Road, Pentre.

Wales.—Aug. 10.—For alterations to St. Barnabas mission-room, Avoca Street, Grangetown, Cardiff. The Rev. T. P. Price, 2 Taff Embankment, Grangetown, Cardiff.

Wales.—Aug. 10.—For the erection of a large bungalow at Coed-Ely, Llantrisant, Glam. Mr. P. E. Jones, Church Street, Pontypridd.

Wales.—Aug. 12.—For erection of a greenhouse at Allt-yr-yn Hospital, Newport, Mon. The Borough Engineer, Town Hall, Newport, Mon.

Wales.—Aug. 13.—For the provision and erecting of a temporary iron building in the playground of the Ferndale Council school, Pentre, for the Rhondda Urban District Council. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

Wales.—Aug. 17.—For the construction of an underground convenience on the West Shore, Llandudno. The Engineer, Town Hall, Llandudno.

Wallasey.—Aug. 16.—For the supply of 70,000 wood paving blocks (Jarrah and creosoted Baltic red deal alternatively). Mr. W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire.

Warrington.—Aug. 19.—For the erection of a public elementary school. Mr. J. Moore Murray, secretary, Sankey Street, Warrington.

Workington.—Aug. 17.—For the whole of the work required in the erection and completion of a technical and secondary school at Workington, Cumberland. Deposit 2*l.* 2*s.* Messrs. Clark & Moscrop, architects, Darlington, or the County Education Offices, The Courts, Carlisle, and the Town Hall, Workington.

Worksop.—Aug. 8.—For laying about 5,400 yards of 12-inch, 9-inch, and 6-inch glazed earthenware and cast-iron pipes, sewers, and construction of manholes, tanks, filters, &c., at Wales and Wales Bar. Deposit 5*l.* 5*s.* Mr. James Snow Whall, 66 Bridge Street, Worksop.

TENDERS.

ASHTON-UNDER-LYNE.

For the erection of a new savings bank. Messrs. W. H. George & Sons, architects, Ashton-under-Lyne.

Wooley	£3,435	0	0
Storrs & Sons	3,380	0	0
Ridyard	3,340	0	0
Marshall & Sons	3,297	0	0
Dean	3,260	0	0
Gibson & Sons	3,203	0	0
Shuttleworth Bros.	3,180	0	0
Robinson	3,168	0	0
Saxon Bros., Stalybridge (*accepted subject to certain omissions*)	3,160	0	0
Carlyle	3,158	0	0

CARDIFF.

For erection of new schools for 1,094 children at Kitchener Road, Canton, for the Cardiff education committee.

Williams	£13,999	0	0
Davies & Howell	13,870	0	0
Knox & Wells	13,759	16	3
Allan & Co.	13,663	7	1
Haines	13,566	0	0
Davies & Sons	13,548	0	0
Shail	13,500	0	0
Turner & Sons	13,408	6	0
Symonds & Sons	13,400	0	0
Howells	13,297	0	0
Morgan	13,185	0	0
Bond, Beda Road*	12,265	15	1

* Accepted subject to confirmation by education committee and Council.

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HESWALL.

For extensions at Heswall Council school, Cheshire. Messrs. C. E. DEACON & HORSBURGH, architects, Liverpool.

Hall & Jamieson	£1,990 0 0
Haugh & Pilling	1,895 0 0
Forde	1,889 0 0
Greene & Co.	1,885 0 0
Morrison & Sons	1,850 0 0
Tyson	1,800 0 0
Merritt	1,793 0 0
Duthie & Dobson	1,743 0 0
Webster	1,737 0 0
Fleming & Co.	1,649 0 0
J. & F. KITCHEN, Heswall (*accepted*)	1,624 0 0

LONDON.

For the supply of creosoted deal blocks, for the London County Council.

A. 40,000, size 3 inches by 9 inches by 4 inches, delivered to Oval dépot.
B. 15,000, size 3 inches by 9 inches by 4 inches, delivered to Deptford Wharf.
C. 5,000, size 3 inches by 9 inches by 4 inches, delivered to Battersea Wharf.
D. 15,000, size 3 inches by 9 inches by 4½ inches, delivered to Oval dépot.
E. 15,000, size 3 inches by 9 inches by 4½ inches, delivered to Deptford Wharf.
F. 10,000, size 3 inches by 9 inches by 4½ inches, delivered to Battersea Wharf.
G. 70,000, size 3 inches by 9 inches by 4½ inches, delivered to Metropolis Wharf.
H. 30,000, size 3 inches by 9 inches by 4½ inches, delivered to Parkhurst Road.

Prices at per thousand.
Delivered by van.

	A			B			C			D		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Gabriel & Sons	5	18	0	5	18	0	5	19	0	6	11	9
The Improved Wood Pavement Company	6	4	0	6	2	0	6	4	0	6	18	0
Burt, Boulton & Haywood	6	2	6	6	2	2	6	4	1	6	17	9
Howard, Bros. & Co.	6	5	9	6	5	9	6	5	9	7	1	1
Acme Flooring and Paving Co. (1904)	6	9	9	6	9	9	6	9	9	7	4	3
Lee & Sons	6	12	0	6	13	6	6	10	6	7	7	6
Sir William Burnett & Co.	6	13	0	6	13	0	6	13	0	7	9	0

	E			F			G			H		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Gabriel & Sons	6	11	9	6	12	9	6	12	9	6	13	6
The Improved Wood Pavement Company	6	16	0	6	18	0	6	18	0	6	18	0
Burt, Boulton & Haywood	6	17	6	6	19	7	6	18	6	6	19	7
Howard, Bros. & Co.	7	1	1	7	1	1	7	1	1	7	1	1
Acme Flooring and Paving Co. (1904)	7	4	3	7	4	3	7	4	3	7	4	3
Lee & Sons	7	9	0	7	6	0	7	9	9	7	9	9
Sir William Burnett & Co.	7	9	0	7	9	0	7	9	0	7	9	0

Delivered by barge.

	A			B			C			D		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Gabriel & Sons		—		5	17	0	5	19	0		—	
Burt, Boulton & Haywood		—		6	0	9	6	0	9		—	
Howard, Bros. & Co.		—		6	1	9	6	1	9		—	
Acme Flooring and Paving Co. (1904)		—		6	6	3	6	6	3		—	
Lee & Sons		—		6	11	0	6	11	0		—	
Sir W. Burnett & Co.		—		6	8	0	6	8	0		—	

	E			F			G			H		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Gabriel & Sons	6	10	9	6	12	9	6	12	6		—	
Burt, Boulton & Haywood	6	15	11	6	15	11	6	15	11		—	
Howard, Bros. & Co.	6	17	1	6	17	1	6	18	1		—	
Acme Flooring and Paving Co. (1904)	7	0	9	7	0	9	7	1	9		—	
Lee & Sons	7	6	6	7	6	0	7	9	0		—	
Sir W. Burnett & Co.	7	4	0	7	4	0	7	4	0		—	

LONDON—*continued.*

For the supply of Jarrah wood paving blocks, for the London County Council.

A. 60,000, size 3 inches by 9 inches by 4 inches, delivered to Oval dépot.
B. 20,000, size 3 inches by 9 inches by 4 inches, delivered to Deptford Wharf.
C. 60,000, size 3 inches by 9 inches by 4½ inches, delivered to Oval dépot.
D. 20,000, size 3 inches by 9 inches by 4½ inches, delivered to Deptford Wharf.
E. 10,000, size 3 inches by 9 inches by 4½ inches, delivered to Battersea Wharf.
F. 35,000, size 3 inches by 9 inches by 4½ inches, delivered to Parkhurst Road.
G. 75,000, size 3 inches by 9 inches by 4½ inches, delivered to Metropolis Wharf.
H. 30,000, size 3 inches by 6 inches by 3¼ inches, delivered to Oval dépot.
I. 25,000, size 3 inches by 6 inches by 3¼ inches, delivered to Deptford Wharf.
J. 5,000, size 3 inches by 6 inches by 3¼ inches, delivered to Battersea Wharf.
K. 10,000, size 3 inches by 6 inches by 3¼ inches, delivered to Metropolis Wharf.
L. 5,000, size 3 inches by 6 inches by 3¼ inches, delivered to Parkhurst Road.

Price at per thousand.
Delivered by van.

	A			B			C			D		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Millars' Karri and Jarrah Co. (1902)	9	14	0	9	14	0	10	18	3	10	18	3
Griffiths & Co.	10	0	0	10	0	0	11	3	6	11	3	6
Acme Flooring and Paving Co. (1904)	10	1	0	10	1	0	11	4	6	11	4	6
Improved Wood Pavement Co.	10	7	6	10	7	6	11	12	6	11	12	6

	E			F			G			H		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Millars' Karri and Jarrah Co. (1902)	10	19	6	11	2	6	11	2	6	5	13	6
Griffiths & Co.	11	3	6	10	16	0	10	16	0	6	0	0
Acme Flooring and Paving Co. (1904)	11	4	6	11	4	6	11	4	6	6	1	0
Improved Wood Pavement Co.	11	12	6	11	12	6	11	12	6		—	

	J			J			K			L		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Millars' Karri and Jarrah Co. (1902)	5	13	6	5	13	6	5	13	6	5	13	6
Griffiths & Co.	6	0	0	6	0	0	5	12	0	5	12	0
Acme Flooring and Paving Co. (1904)	6	1	0	6	1	0	6	1	0	6	1	0
Improved Wood Pavement Co.		—			—			—			—	

Delivered by barge.

	A			B			C			D		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Millars' Karri and Jarrah Co. (1902)		—		9	9	0		—		10	13	0
Griffiths & Co.		—		9	15	0		—		10	18	0
Acme Flooring and Paving Co. (1904)		—		9	15	0		——		10	17	6

	E			F			G			H		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Millars' Karri and Jarrah Co. (1902)	10	14	0		—		10	19	0		—	
Griffiths & Co.	10	18	0		—		10	10	0		—	
Acme Flooring and Paving Co. (1904)	10	17	6		—		11	0	0		—	

	I			J			K			L		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Millars' Karri and Jarrah Co. (1902)	5	10	6	5	10	6	5	10	6		—	
Griffiths & Co.	5	17	0	5	17	0	5	9	0		—	
Acme Flooring and Paving Co. (1904)	5	15	0	5	15	0	5	15	0		—	

For repairs and redecoration at Caxton Hall, for the Westminster City Council.

De Jong & Co.	£3,588 0 0
Campbell, Smith & Co.	3,285 0 0
Bywaters & Sons	3,030 0 0
Styles & Son	2,920 0 0
Kearley	2,884 0 0
Kirk & Kirk, Westminster (*recommended*)	2,870 0 0

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LONDON—*continued.*

For enclosing additional land adjoining Laxton Street school, Bermondsey, and erection of a complete domestic economy centre thereon, for the London County Council.

Proctor & Sons	£4,657 3 9
Holloway	4,070 0 0
Johnson & Co.	3,949 0 0
Rice & Son	3,871 0 0
Downs	3,820 0 0
Appleby & Sons	3,730 0 0
Triggs	3,683 0 0
Wallis & Sons	3,677 0 0
Lole & Co.	3,670 0 0
McLaughlin & Harvey	3,599 9 9
Holliday & Greenwood	3,597 0 0
J. & C. Bowyer	3,589 0 0
Leng, Deptford (*recommended*)	3,542 0 0
Architect's estimate	3,650 0 0

For the construction of underground conveniences in Finsbury Park, by the Finsbury Gate, Seven Sisters Road, for the Islington Borough Council. Mr. J. Patten Barber, borough engineer, Town Hall, Upper Street.

Pedrette	£3,189 0 0
Davis, Bennett & Co.	2,900 0 0
Shanks & Co.	2,851 0 0
Jennings	2,800 0 0
Nightingale	2,800 0 0
Roberts & Co.	2,797 0 0
Pinney	2,710 0 0
Fitch & Cox	2,649 0 0
Sabey & Son	2,600 0 0
Stevens & Sons	2,598 0 0
McLaughlin & Harvey	2,499 0 0
Wilkinson & Co.	2,399 0 0
F. & G. Foster, Norwood Junction (*accepted*)	2,270 0 0

For erection of new premises, for the Hatcham Liberal Club, Queen's Road, Peckham.

Hollingsworth	£6,486 0 0
Holloway Bros.	6,200 0 0
Higgs & Hill	6,138 0 0
Godson & Sons	5,998 0 0
Leng	5,980 0 0
H. L. Holloway	5,937 0 0
Nash	5,644 0 0
Nightingale	5,575 0 0
Ware, Plumstead (*accepted*)	5,573 0 0

MIDDLESEX.

For redecoration of the following schools, for the Middlesex County Council. Mr. H. G. Crothall, architect to the education committee.

Interior and Exterior Redecoration.

Hounslow Polytechnic.

Lacey	£105 10 0
Jamieson	96 0 0
Keen	95 0 0
Danels & Son	83 0 0
Morgan, Isleworth (*accepted*)	65 2 6

Tottenham Polytechnic.

Stewart	263 10 0
Moore & Son	231 0 0
Porter	225 0 0
Treasure & Son	211 0 0
Knight & Son	172 13 0
Groves & Son, Tottenham (*accepted*)	149 15 0

Alperton Council.

Tribe & Co.	217 0 0
Underwood, Sudbury (*accepted*)	146 16 9

Ashford Council (Middlesex).

Jordan	175 0 0
Webb & Grimsdale	98 16 0
Francis, Ashford (*accepted*)	67 7 0

Brentford, Rothschild's Council.

Hidden	230 0 0
Kemble	185 0 0
Lacey	139 10 0
Jamieson, Brentford (*accepted*)	126 0 0

Feltham Council.

Watson, Feltham (*accepted*)	188 0 0

MIDDLESEX—*continued.*

Hanwell Council.

Judson	415 0 0
Jamieson	283 7 0
Platford & Son, Hanwell (*accepted*)	244 7 6

Harrow, Greenhill Council.

Gooderson	215 0 0
Lacey & Eyden	187 10 0
House	176 0 0
Woodbridge, Harrow (*accepted*)	174 8 0

Harrow Weald Council.

Twinn	86 10 0
Heffer	83 10 0
Pickrill, Wealdstone (*accepted*)	81 18 0

Harrow, Roxeth Council.

Batchelor	294 0 0
Collins & Charles	278 18 4
Woodbridge, Harrow (*accepted*)	186 7 6

Shepperton Council.

Jordan	238 0 0
Gurney	139 10 0
Lucas	109 0 0
Jennings	100 0 0
Francis, Ashford (*accepted*)	97 7 0

Southall, North Road Council.

Jamieson	180 17 6
Platford & Son	160 0 0
A. & B. Hanson	156 10 0
Brown & Son	146 15 0
Plaistowe, Southall (*accepted*)	132 0 0

Ashford, Spelthorne Council.

Webb & Grimsdale	71 6 0
Francis, Ashford (*accepted*)	56 15 0

Wealdstone, High Street Council.

Twinn	230 10 0
Pickrill	198 12 4
J. & J. Bailey, Wealdstone (*accepted*)	197 10 0

Interior Redecoration Only.

Cowley National.

Try, Cowley (*accepted*)	13 6 0

Dawley National (Infants).

Portsmouth	9 10 0
Salter, Hayes (*accepted*)	8 10 0

Uxbridge, Hillingdon West.

Buttrum	50 0 0
Fassnidge & Son	46 0 0
H. E. & G. Pratt, Uxbridge (*accepted*)	36 7 6

New Brentford National.

Hidden	55 0 0
Lacey	35 0 0
Jamieson	28 5 0
Kemble, Southall (*accepted*)	24 5 0

Shepperton National.

Jordan	48 0 0
Lucas	29 10 0
Gurney	29 5 0
Jennings	20 0 0
Francis, Ashford (*accepted*)	17 7 0

South Mimms.

Lucas	67 12 6
Worboys	46 14 6
Chilton, South Mimms (*accepted*)	40 0 0

Sunbury Parochial.

Gurney	25 0 0
Francis, Ashford (*accepted*)	21 15 0

Teddington, Victoria.

Thomas	42 10 0
Collinson	39 0 0
Rice & Son, Teddington (*accepted*)	33 10 0

Uxbridge, St. Mary's Roman Catholic.

Buttrum	16 0 0
Fassnidge & Son	16 0 0
Try	11 5 0
H. E. & G. Pratt, Uxbridge (*accepted*)	10 15 0

Uxbridge, New Windsor Street.

Fassnidge	19 10 0
Buttrum	18 10 0
H. E. & G. Pratt	16 10 0
Try, Cowley (*accepted*)	14 19 0

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MIDDLESEX—*continued.*

West Drayton National.

Johnson & Stunt	58 10 0
Hitchcock	52 18 0
Try	46 0 0
Pym	44 10 0
Chedwell, West Drayton (*accepted*)	33 0 0

ROMFORD.

For erection of new business premises and dwelling house, with works incidental thereto, on the site of the Old Windmill and Bells, Market Place, Romford, for Mr. L. F. Stone. Mr. E. J. Little, architect, Hornchurch Road, Romford. Mr. C. E. Pease, F.S.I., surveyor, 16 Clifford's Inn, Fleet Street, E.C.

Smith & Co.	£5,547 0 0
Hibberd Bros.	4,999 0 0
Fryd	4,859 0 0
Perton & Co.	4,765 0 0
Pinney	4,745 0 0
Shurmur & Sons	4,554 0 0
Wood Bros.	4,485 0 0
Sanford & Co.	4,450 0 0
Brown Bros.	4,400 0 0
Myall & Upson	4,400 0 0
Foster	4,388 0 0
Nightingale	4,290 0 0
Bailey	4,280 0 0
Partridge Bros.	4,250 0 0
Dowsing & Davis, Romford *	4,220 0 0
Weibking & Co.	3,990 0 0
Fitch & Cox	3,692 0 0

*Accepted excluding shop fronts.

RUGBY.

For erection of new palace theatre.

Harris	£4,840 0 0
Lovell	4,805 0 0
Linnell & Son	4,768 0 0
Hollowell	4,725 0 0
Parnell & Son	4,695 0 0
Winn & Son	4,664 5 0
Woodhouse	4,534 0 0
Adams & Son	4,390 0 0
Cockerell, Rugby (*accepted*)	4,344 0 0

UPMINSTER.

For erection of new Congregational church.

Brown	£4,249 0 0
Ashby & Horner	3,629 0 0
Whitehead	3,570 0 0
Harris & Wardrop	3,537 0 0
Griggs & Co.	3,530 0 0
Miles & Upson	3,486 0 0
Clemens Bros.	3,450 0 0
Bruty	3,387 0 0
Roberts	3,377 0 0
Dowsing & Davis	3,375 0 0
Jerram	3,248 0 0
Hammond & Miles	3,205 10 0
Carter, Grays (*accepted*)	2,885 0 0

WALES.

For constructing streets and sewers at Duffryn Rhondda, Port Talbot, for the Duffryn Rhondda Colliery Co., Ltd. Mr. F. B. Smith, C.E., Port Talbot.

Jones	£2,486 14 0
Walker	2,422 8 11
Strachan	2,366 10 0
W. & T. R. Watson	2,257 0 0
Sutherland	2,208 17 0
Barnes & Chaplin	2,143 13 0
Morgan	2,104 13 8
Richards	2,073 1 11
Willis	2,043 7 0
Hancock	2,007 5 7
Scott, Port Talbot (*accepted*)	2,007 0 0
Thomas & Jones	1,997 12 0
Collins	1,922 19 0

WALES—*continued.*

For erection of a new Council school building at Goodwick, for the Pembrokeshire Education Authority. Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

Nicholas Bros	£6,920 0 0
Davies & Sons	6,550 0 0
Cole & Sons	6,419 0 0
Hayward & Wooster	6,281 0 0
Thomas	6,225 0 0
Davies & Howell	6,150 0 0
John & Griffiths, Fishguard (*accepted*)	5,685 16 7

TRADE NOTES.

We are informed that the Brightside Foundry and Engineering Company, Ltd., have secured from H.M. Office of Works the contract for large heating installation for the New Money Order Office in London.

The Bath Stone Firms, Ltd., supplied the whole of the Bath stone used for the erection of the two west towers of Truro Cathedral, which were recently consecrated. The work was carried out under the supervision of Mr. F. L. Pearson, the architect.

The building trade at Swansea is beginning to look up, and one of the most recent buildings that has been completed is the New Art Gallery at Alexandra Road, presented by Mr. Vivian and designed by Mr. Glendenning Moxham, M.S.A., of Castle Street, Swansea. This building has been erected by Messrs. Lloyd Bros., of Swansea, and the stone came from the Monks Park Quarries of the Bath Stone Firms, Ltd.

Several towns in the radius of London now possess self-propelled fire appliances, including Willesden, Harrow, Finchley, Merton, Heston, and Isleworth, all of which have Merryweather motors. The latest recruit is Bromley (Kent), where the Town Council has passed an order for two Merryweather motors, viz., a petrol "Hatfield" fire-engine capable of delivering 300 gallons a minute, and a petrol hose-tender, escape, and combined first-aid machine. The substitution of mechanical for horse traction with fire appliances has made gigantic strides during the past few years. The capabilities of the self-propelled machine for instant turn-out and rapid travelling over all kinds of roads are immense factors in its favour. It may be mentioned that the Willesden Council have had such satisfactory results with their Merryweather motor that they have recently ordered a second machine from the same firm.

VARIETIES.

Messrs. Carver & Symon, architects, Arbroath, N.B., have prepared plans for the extension of the Keptie School at a cost of 1,700*l.*

The Dysart School Board on Monday passed plans for an extension of Gallatown Infant School to accommodate 200 pupils.

The Darlington Borough Education Committee have agreed that the plans for providing 100 additional places at the Corporation Road infant school be approved.

Plans for a new Council elementary day school at Heap Bridge, in the borough of Heywood, have been passed by the Heywood Education Authority, and sent to the Board of Education for approval.

A piece of ground in Lyle Road, Greenock, near Fort Matilda Railway Station, has been feued for the erection of ten semi-detached cottages, suitable for certain of the workers at the Clyde Torpedo Factory.

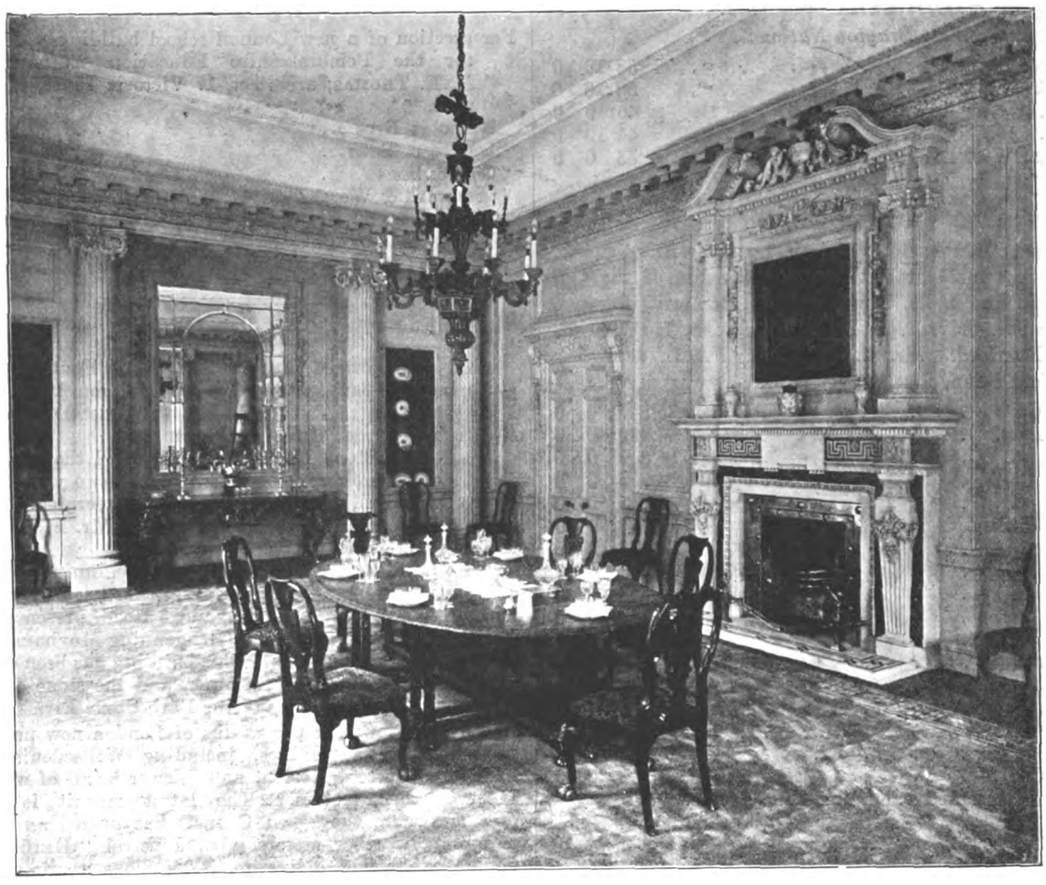
The Cumberland County Property Committee recommend the County Council to sanction the carrying out of the original plan for the proposed alterations to the Council chamber at Carlisle at an estimated cost of 2,200*l.*

The Parliamentary Committee of the Manchester Corporation have decided to ask the City Council to apply to Parliament for powers to carry out the scheme of the City Surveyor for dealing with the main drainage of the city at a cost of about a million sterling.

The firm of Messrs. Woodrow & Hilsdon, architects, 6 Raymond Buildings, Gray's Inn, W.C., have dissolved partnership. Mr. E. A. E. Woodrow, F.R.I.B.A., will continue to practise at the above address, while Mr. Horace J. Hilsdon, F.R.I.B.A., has removed to Bedford Row House, 50 Theobald's Road, Gray's Inn, W.C.

An open competitive examination for not fewer than seven situations as assistant examiner in the Patent Office will be held by the Civil Service Commissioners in Sep-

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MESSRS. WHITE, ALLOM & CO.'S EXHIBIT AT BRUSSELS EXHIBITION.

tember next. The examination will commence on the 26th of the month, and forms of application for admission to it are now ready for issue, and may be obtained on request addressed by letter to the Secretary, Civil Service Commission, Burlington Gardens, London, W.

The Manchester Town Council have for some time past had the inadequacy of the Council Chamber to meet the requirements of the members under consideration. There have been at least two proposals—(1) to enlarge the Council Chamber and (2) to make arrangements for Council meetings to be held in the large hall. A sub-committee has had before it a proposal for the enlargement of the Council Chamber at a cost of 6,000*l*. The consideration of this proposal stands adjourned.

Cheap tickets, available for the week-end, eight or fifteen days, one month, &c., are issued during August, September, and October from certain London and suburban stations by the South-Eastern and Chatham Railway to Folkestone, Hythe, Canterbury, Birchington, Westgate, Margate, Broadstairs, Ramsgate, Littlestone, Deal, Sandwich, Herne Bay, Dover, St. Margaret's Bay (Martin Hill Station), Tunbridge Wells, Bexhill-on-Sea, Hastings, St. Leonards, Rye, and Winchelsea. For holiday programme containing full particulars of the cheap tickets, application should be made to Mr. Vincent W. Hill, S.E. & C. Rly., London Bridge Station, S.E.

The Local Government Board, at the request of the Board of Trade, has issued a circular drawing the attention of local authorities to certain provisions in the Trade Boards Act. Attention is drawn to the fact that the effect of Section 7 of the Act, so far as the local authority is concerned, is that pending the coming into full operation of any minimum rate of wages fixed by the trade board, the local authority is precluded from entering into contracts with any employer in the particular trade and area to which the rate is applicable who has not given the specified notice to the trade board that he is willing that the minimum rate should be obligatory upon him. When rates have been fixed by any trade board, information as to the registration of employers under Section 7 of the Act will be obtainable on application to the Secretary of the trade board in question at the Office of Trade Boards, Trafalgar Buildings, Northumberland Avenue, London, S.W.

MESSRS. WHITE, ALLOM & CO.'S EXHIBIT AT THE BRUSSELS EXHIBITION.

Dining Room.—This room, which is constructed entirely in pine, is a natural phase of development from the eighteenth century English work. While having the vigour of the earlier Georgian work it has the lighter proportions that are characteristic of much of the French work of Louis XVI.'s time, which has been a special endeavour in the design of the English work of Messrs. White, Allom & Co. In finish and quality it is equal to the finest of the old, and its strict adherence to classic tradition has made it much admired by connoisseurs from all countries. The colour, which is a soft green grey, with enrichments slightly lighter, and carpet and curtains of slightly deeper tone, gives it an atmosphere that is particularly steady and pleasing. The furniture is characteristic of that which was in use during the eighteenth century. The chairs, which are the earliest in type, are partly new and partly genuine old ones, while the rest of the furniture is modern, made in walnut and gold, softly toned down and showing none of the harsh gilding associated with new work. Special notice should be taken in this room of the chandelier, which is a genuine old one, and has been purchased by a German Museum.

The Oak Morning Room is a very refined example of the work that was made in England during the first ten years of the eighteenth century. Part of the carving is really the work of Grinling Gibbons, but it is practically impossible to distinguish between the new and the old, although the new work is in no way a repetition of the old portions. The cornice has the leaf and scroll enrichments carved in lime tree, perforated completely through, showing the oak cove into which the enrichment is fixed. The ceiling is very daintily dished and slightly ornamented. The enrichments and mouldings in this room have been entirely gilded, but carefully rubbed down and toned so that they almost in colour equal the weight of the oak itself. The curtains and carpet are extremely interesting, the former being a mulberry colour and moss green, while the carpet is of moss green with a mulberry coloured ornamental margin. The furniture, which is mostly old, is extremely refined, especially three of the well-known set of chairs which have been lent by Mr. Charles Allom, part of the set which was

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MESSRS. WHITE, ALLOM & CO.'S EXHIBIT AT BRUSSELS EXHIBITION.

in the Loan Collection of the Franco-British Exhibition. These are probably amongst the finest Queen Anne chairs in the world. The exterior of this exhibit is really composed of old English oak panelling of Elizabethan period, and forms a quiet dignified exterior to what is probably one of the finest British decorative exhibits that has been seen for many years in any exhibition.

Mr. Herring, the manager and engineer to the Edinburgh and Leith Gas Commissioners, has resigned his office, which carried with it a salary of 1,500*l.* a year, together with a house. The Commissioners have now agreed (1) that Mr. Herring should be retained as consulting engineer, visiting the works at Granton once a month at least, keeping in touch with the business, and advising the Commissioners generally, at a fee of 500*l.* a year; and that he should also be retained as consulting constructional engineer, at a fee of 5 per cent. on the value of the work executed; and (2) that Mr. Masterton should be appointed engineer for a year at a salary of 600*l.*; on the expiry of the year the matter to be reconsidered.

CRYSTAL PALACE SCHOOL OF ENGINEERING.

The one hundred and thirteenth award of certificates to the students took place at the School, adjoining the South Tower, on Thursday, July 28, when James Charles Inglis, Esq., President of the Institution of Civil Engineers, presided; and after a few appropriate introductory remarks he called on Mr. Maurice Wilson, the vice-Principal of the School, to read the examiners' reports, which were highly satisfactory. The work in connection with the Mechanical section of the School for the past term was examined by Mr. J. S. Owens, A.M.I.C.E., while Mr. H. G. Lloyd, A.M.I.C.E., examined the students in the Civil Engineering section, and Mr. J. G. W. Aldridge, A.M.I.C.E., acted as examiner in the Electrical section.

In the course of his address Mr. Inglis said that it was not desirable for the students to confine themselves entirely to one branch of the profession, but they should take a general view of it and try to master the principles in more than one direction, so that they might be in a position to direct the forces of nature for the benefit of mankind, combining the practical with the theoretical, and it would be time enough to specialise later on. He also urged them to keep the commercial side in view, as engineering was the same as other walks of life, and

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the business side must not be overlooked. He was pleased to see that the reports of the examiners showed such satisfactory results, and he would point out that transport was becoming more and more recognised by the Government; he urged them therefore to study that branch of engineering which would meet with its due reward.

The Principal, Mr. J. W. Wilson, M.I.C.E., then called up the students to receive their certificates, which were handed to them in rotation by the chairman. The awards were for work done in the first year's course of mechanical engineering in connection with lecture examinations on "Railways, their Construction and Appliances." Awards were also given for the second year's course of civil engineering, and for work in the electrical section.

The thanks of the directors of the Crystal Palace Company were unanimously tendered to the examiners, who gave their valuable services gratuitously, and after Messrs. Owens, Lloyd and Aldridge had suitably responded, an interesting address was delivered to the students by Mr. J. W. Wilson, the Principal, and the proceedings concluded with a hearty vote of thanks to the Chairman for presiding on the occasion.

It may be added that the long list of appointments gained by students of this School has been supplemented by the following among the latest recorded ones:—

A. W. Okell, A.M.I.C.E., construction engineer to the extension to the East of the Central Uruguay Railway.

H. O'Brien, municipal engineer, Bengal.

W. R. Hörner, draughtsman, Royce, Ltd., electrical and mechanical engineers, Manchester.

E. S. Hector, resident engineer, Federated Malay States Railway extension.

H. D. Mehandru, assistant engineer to the Nizam's Government, Hyderabad.

F. A. Pawley, A.M.I.C.E., district engineer, S. I. Railway, Madras.

P. D. Robinson, on the technical staff of the Contraflo Condenser Company.

M. E. Wright, draughtsman, Grand Trunk Railway Company, Montreal.

P. B. Motley, assistant engineer of bridges, Canadian Pacific Railway Company, Montreal.

L. S. Layman, assistant engineer, Southern Nigerian Railway.

F. W. Leeper, assistant engineer, Canadian Pacific Railway.

W. N. Green, assistant engineer, Ferro-Carril de Buenos-Aires al Pacifico, Bahia Blanca.

W. H. Baker, draughtsman to Messrs. Sugg & Co.

C. G. Gray, editor of the *Aero*.

G. S. Jones, assistant to the borough surveyor of Margate.

J. A. O'Brien, technical director of the Warner Engineering Company.

A. de C. Feio, railway engineer, Alcobaca, Brazil.

F. B. Nicholson, inspecting engineer for Sir John Wolfe Barry & Partners, Poland.

J. Shearman, locomotive foreman, L. & N. W. R., Wolverhampton.

D. H. Whyte, draughtsman to the Atlantic, Quebec and Western Railway, Canada.

G. W. Miller Scott, inspector of way and works, Assam Bengal Railway.

M. H. Sears, engineers' examining draughtsman, Clark & Stanfield, Westminster.

E. T. Henstridge, assistant to G. G. M. Hardingham, C.E.

W. H. Haselgrove, electrical and mechanical engineer, Queen's Road, Battersea.

Hon. A. I. Pelham, district engineer, Soudan Government Railways.

The George Watson's Ladies' College, Edinburgh, is to be enlarged, at a cost of about 12,000*l*., by the addition of a new wing on the site of 6 and 7 George Square. The plans, which were last week approved by the Dean of Guild Court, have been prepared by Mr. G. Washington Browne, R.S.A.

The principal linings granted at Glasgow Dean of Guild Court last week were:—Andrew Motherwell, grain merchant, Main Street, Gorbals, to take down existing buildings and erect new buildings at 127 Cumberland Street; the Scottish Electric Picture Palaces, Ltd., 65 Bath Street, to erect a hall to be used as a picture palace at 252 New City Road; John Laing & Son, builders, Carlisle, to erect a terrace of dwelling-houses in Durward Drive and St. Ronan's Drive, Shawlands.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The June Examinations.

The Preliminary Examination, qualifying for registration as Probationer R.I.B.A., was held in London and the provincial centres indicated below on June 13 and 14. One hundred and seventy-four candidates were admitted, and claims for exemption from sitting were allowed to the number of forty-six. The remaining 128 were examined, with the following results:—

District.	Number Examined.	Passed.	Relegated.
London . . .	62	42	20
Birmingham . .	7	5	2
Bristol . . .	8	7	1
Cardiff . . .	8	4	4
Glasgow . . .	7	6	1
Leeds . . .	8	6	2
Manchester . .	25	16	9
Newcastle . .	3	1	2
	128	87	41

The passed candidates, with those exempted—making a total of 133—are as follows:—

Adams, Edward; Angus, Laurence Mortimer; Appleby, Sidney Derrick; Archer, Howard Dennet; Ashworth, James Rothwell; Bainbridge, George Percival; Bamford, Albert; Barry, Caryl Arthur Ransome; Beath, George Christian; Belfield, Eric; Bennett, Thomas Penbertly; Berry, Harold; Bevan, George, Junr.; Bill, Edward Richard; Bowes, Trevor Straker; Brigden, Wilfrid Harcourt; Brown, Eric Howard; Brown, Wilfred; Cavanagh, Edmund; Cave, Robert Sims; Cawkwell, Robert; Chandler, Allen; Ching, William Wilmot Thorne; Chalkley, Thomas Henry; Church, Leslie Donald Algar; Clarke, Howard Hosegood; Clarke, Leonard Harris; Cook, George Sydney; Cooke, Richard Thomas; Cooksey, Harold Thoresby; Cornish, Charles Edwin; Craig, John Pattison; Craik, Fettes Murray; Crumpler, Arthur Stephen; Dartnall, James Ambrose; Davies, Edward Cecil; Davies, Hugh Frederic; Dickinson, John; Diplock, Harry Underhill; Dixon, Cyril Burton; Douglas, Andrew; Dubuis, Louis Gabriel Alfred; Edwards, John Ralph; Egerton, Horace Wood; Evans, William John; Fisher, Stanley Howe; Foote, Alexander Allan; Foster, Joseph Ernest; Francis, George Eric; Fromant, Edmund George Dawson; Fryer, Cyril Frederick; Furse, Ronald Edward; Glass, Edwin William; Gordon, Alexander; Graham, Richard David; Green, Frederick Sidney; Griffin, Douglas Morley; Hall, Frederick William George; Harding, Herbert John; Hardy, Philip; Harkess, William; Haseldine, Cyril Francis William; Haynes, Frederick Stanley; Henderson, Arbor; Henderson, James Murdoch Dalziel; Henderson, Robert Coutts; Hickmott, Herbert Lewis; Holt, George Herbert Gordon; Hughes, Thomas William; Humphreys, Reginald; Hyde, Arthur James; Hyde, George Henry; Jones, Sidney; Kenworthy, Gordon; Kersey, Arthur Oliver; Kirby, Rufus; Lamb, Herbert Arthur John; Lawson, John Boyd; Lees, Albert Edward; Leys, Colin Maclaren; Locke, Denis Walford; Locke, William Wellings; Love, Robert Maclaren; Mackay, Harry; Macpherson, John; McConnell, Arthur Percy; Mercer, Charles Wilfred; Moss, George James; Murray, Cyril Aubrey; Needham, Alec; Nisbet, Alec; Norris, Leslie Archibald; Nundi, Rash Beheri; Owen, Wilfrid Scotter; Penderel-Brodhurst, Bernard Richard; Pennington, William Fulton; Perrin, Guy; Pidsley, Wilfrid Gould; Pollard, Roy; Pratt, Neville Herbert; Preston, Richard Herbert; Richardson, Herbert Clifford; Robb, James; Robertson, William Alexander; Rubery, Samuel; Saunders, William George; Schofield, Riley; Scoles, Henry Joseph; Shakeshaft, Joseph Edward; Shenstone, Gerald; Shuffrey, Gilbert; Sidki, Mahmond; Slater, Norman Woodford; Smail, Herbert Morgan; Spencer, William Charles; Stoner, Arthur Philip; Stott, Alfred Edgar; Stuttaford, Thomas Pleadwell Cyril; Tanner, Edgar; Terrace, Thomas Speedie Mitchell; Tozer, Frederick Milton; Turnbull, John; Vincent, Sybil Aimée; Walker, Leonard Harbord; Wallace, Robert Stuart; Wallis, Albert George; Watson, Ernest Lancelot; Watt, John Desborough; Welsh, Stephen; Whitbread, Leslie George; Whitehouse, Lynn; Willson, Ernest; Wilson, Percy.

The Intermediate Examination, qualifying for registration as Student R.I.B.A., was held in London and the undermentioned provincial centres on June 13, 14, 16, and

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17. One hundred and thirty-three candidates presented themselves and were examined, with the following results:—

District.	Number Examined.	Passed.	Relegated.
London . . .	76	31	45
Bristol . . .	5	1	4
Cardiff . . .	7	2	5
Glasgow . . .	1	1	0
Leeds . . .	16	4	12
Manchester . .	19	5	14
Newcastle . .	9	4	5
	133	48	85

The successful candidates, who have been registered as Students R.I.B.A., are as follows, their names being given in order of merit as placed by the Board of Examiners:—

Brittan, Harold William; Mobbs, Hedley Adams; Macgregor, James; Toothill, John Cedric Penman; Hardman, Adrian Thomas; Crouch, Frederick Alfred; Lowes, Albert Edward; Thoms, William George; Scott, Theodore Gilbert; Young, Harold; Anderton, Richard; Benner, Walter; Gibbs, George Herbert; Archer, Herbert Humbley; Young, William Cecil; Pease, Alex; Charlewood, George Edward; Lofthouse, Wallace George; Phillips, Arthur Todd; Ellis, Thomas Gordon; Fincham, Edward; Bhedvar, Sohrab Keikhosru; Baker, Harold; Moore, Frederick William; Ratcliff, Fred; Russell, Andrew Lawrence Noel; Bacon. George Whitaker; Batty, William Arnold; Betts, William Stanley; Cheston, John Allford; Cole, Leopold Edmund; Dailey, Arthur Benjamin; Dearden, Henry, Junr.; Edge, Walter Frederic; Glover, Kenneth; Heal, Albert Victor; Hughes, Basil; Ingham, Walter; Mayhew, Alfred Ernest; McLachlan, Charles; Milburn, Stanley Wayman; Oates, Walter; Perry, Harold Charles; Pratten, Alfred; Sherwin, Cecil Thomas; Taylor, Herbert Samuel; Thomas, Edward John; Williams, Stanley Hurst.

The following Probationers, possessing the qualifications required by the regulations, have been exempted by the Council from sitting for the Intermediate Examination, and have been admitted as Students R.I.B.A.:—

Angus, Laurence Mortimer; Owen, Wilfrid Scotter.

The Final and Special Examinations were held in London from June 23 to July 1. Of the 123 candidates examined, fifty-four passed, and sixty-nine were relegated in various subjects. The following are the names of the passed candidates, the † prefixed to a name signifying that the candidate entered for the Special Examination, which is designed for architects in practice and chief assistants exempted by the Council from the Preliminary and Intermediate Examinations and from submitting Testimonies of Study:—

†Armstrong, Colvin Tyler; Ayre, David Wickham; †Bayley, Benjamin Charles Ernest; Beare, Josias Crocker; Brock, Alan St. Hill; Bulmer, Francis Holles; †Calder, James Muir; Catt, Alfred Edward; Chetwood, Henry John; Cornwell, Arthur Redfern; Cowper, James Bertie Francis; Cox. Herbert; Elkington, Hylton Basil; Fiddaman, William Alfred Masters; Grant, Thomas Francis Wiltshire; Gray, James Henry; †Gummer, William Henry; Gunton, William Henry; Hall, Alner Wilson; Hampson, Joseph Louis; Heaven, Frank Henry; Hennell, Sidney Thorn; Hill, Samuel Woods; Hollins, George, Junr.; Hooper, Harold Ridley; Hoyle, Wilfred; †Huddart, Richard Melvil Fane; Jaques, Richard; Keir, William Ingram; †Kennard, John Harold; Leigh, Douglas Chantler; Livock, Stanley Gage; Lynham, Arthur George; Maufe, Edward Brantwood; Mulready, Paul William; Newnum, Eric George; Oliver, Basil; Reis, Victor Cinatti Batallia; Rhodes, Thomas Herbert; Robson, Bernard; Rowse, Herbert James; Savage, Hubert; Shiner, Lawrence Alexander David; Smith, Hubert Niemann; †Snow, Alan Leslie; Stubbs, Edward Woodhouse; Swan, Thomas Aikman; †Topley, Samuel Douglas; Turner, Horace George; Wall, Roland Leslie; Webster, Frank Coutts; Wilson, Geoffrey Cecil; Wilson, Ralph; Woods, Frank.

The following table shows the number of failures in each subject among the 69 relegated candidates in the Final Examination:—

I. Design	48
II. The Principles of Architecture . .	53
III. Building Materials	18
IV. Principles of Hygiene . . .	23
V. Specifications	22
VI. Construction (Foundations, &c.) .	30
VII. Construction (Iron and Steel, &c.) .	27

The following have passed the Special Colonial Examination qualifying for candidature as Associate R.I.B.A. held in Toronto and Johannesburg respectively in November last:—

Cantin, Arthur N. (West Montreal, Canada); Dowswell, Harry Royden, B.A. (Westmount, Quebec, Canada); Monsbourgh, Allan Gordon (Troyeville, Johannesburg, South Africa).

The following have passed the Intermediate Examination held in Sydney, New South Wales, in November 1909, and have been registered as Students R.I.B.A.:—

Boddington, Frederick Eckersley, c/o C. W. Chambers, Esq., Queen Street, Brisbane, Queensland; Cook, George Sydney, Koro Vo, Windsor Road, Baulkham Hills, via Parramatta.

The following have been elected Licentiates of the Institute in accordance with the provisions of By-law 12:—

Elected July 4.

Abercrombie, Balfour (Glasgow); Adkins, John Standen; Allen, Percy (Tunbridge Wells); Baars, Francis Van; Baines, Charlie Owen (Paignton); Baker, Thomas Henry (Colchester); Barker, Thomas Christopher (Scarborough); Bell, Frank (Manchester); Bell, James Frederick Carruthers; Bevan, Thomas Morgan (Derbyshire); Bird, Hugo Ritchie (Brentwood); Birks, Ellis Rawson (Sheffield); Bowley, John (Hastings); Bull, Walter William; Bungard, Arthur William; Carrington, Arthur John Pearson; Chausse, Alcide (Montreal, Canada); Constanduros, Stephanos; Cordery, Harold (Manchester); Denington, Joseph William; Dexter, Sothern; Ewing, Charles Turnbull (Crieff, N.B.); Finlayson, William (Crieff, N.B.); Forbes, James Edwin; George, William Henry (Ashton-under-Lyne); Grimwood, George Francis (Monmouth); Halley, James Mitchell White; Hands, Horace Ireton (Birmingham); Hewitt, Thomas Francis (Lincoln); Hick, Edwin Morcombe; Hunter, David Henry (Glasgow); Isaacs, Charles Henry; Jacques, John Henry; James, John Alfred (Port Talbot); Jenkins, Thomas, J.P. (Burton-on-Trent); Jupp, Sydney; King, Charles; Lacy, George John Joseph; Landstein, Arthur (Liverpool); Martinson, Matthew George (Newcastle); Mennie, Harvey (Aberdeen); Mitchell, John Galt (Edinburgh); Morgan, Thomas James; Morrish, William James Marmaduke (Dorset); Moscrop-Young, Frederick Charles; Neill, James (Leeds); Ogden, Ernest (Machester); Parr, Samuel George, F.S.I.; Payne, James Alfred; Percival, Ernest Llewellyn (Birmingham); Poulter, Harry Reginald (Camberley); Povey, George (Birmingham); Ralph, Ernest Wyatt (Wigan); Rangeley, Alfred (Manchester); Richards, Sydenham W.; Sattin, Benjamin; Shadbolt, Blunden (Horley); Shanks, John (Kirkintilloch, N.B.); Simpson, Lewis William; Spencer, Renfrew (Nottingham); Stedman, Arthur John (Farnham); Steel, John (Wishaw, N.B.); Stoddart, Donald McKay (Glasgow); Tate, John Duncan; Thomas, Albert John; Walford, Henry Hugh; Walker, Samuel George (Nottingham); West, Daniel; White, Frederick; Wilkins, Edward; Wonnacott, Howard John, P.A.S.I.; Wrench, Francis Houlton, Assoc.M.Inst.C.E. (Sheffield); Wright, Gordon Lorimer (Edinburgh); Youngman, Lionel Stanley (Bournemouth).

Elected July 18.

Alder, Cecil (Johannesburg); Baker, Fred (Lincoln); Baker, Howard Leslie; Ballard, William Joseph (Birmingham); Barker, Roger Bradley (Arnside, Westmorland); Betts, William Vallance (Nottingham); Boyd, James Stirling (Glasgow); Copestick, George Christopher (Derby); Elwig, Henry, junr. (Tunbridge Wells); Hammond, Frederic Snowden; Harding, Joseph William Berry (Liverpool); Henderson, John Edward; Hobson, Frederick James (Rawtenstall, Lancs.); Houston, John Alfred Taylor (Glasgow); Hutchins, George (Chester); Jackson, Martin Thomas Ernest; Martin, Thomas (Coatbridge, N.B.); Massey, Izmay (Plymouth); Mayell, Alfred Young; Pearson, Albert Emanuel (Cheltenham); Pickford, Charles; Poole, William Harold (Maidstone); Preston, Archibald Frederick; Rimmington, Frank Harrington Charles (Liverpool); Stebbing, William Pinchard Delane; Stokes, Albert Perkins; Stout, Joseph Ernest (South Shields); White, Frank Rice (Basingstoke); Woods, Walter Harry (Long Eaton, Derby).

The following appointments to Standing Committees have been made by the Council in accordance with By-law 51:—

Art.—Messrs. T. Raffles Davison [*H.A.*], W. A. Forsyth [*F.*], Sir George Frampton, R.A. [*H.A.*], S. S. Reay [*F.*], Sir Aston Webb, C.B., R.A. [*F.*].

Literature.—Messrs. Francis Bond, M.A.Oxon. [*H.A.*], J. D. Crace, F.S.A. [*H.A.*], W. Curtis Green [*F.*], Sir A. Brumwell Thomas [*F.*], E. P. Warren, F.S.A. [*F.*].

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Practice.—Messrs. Ernest Flint [*F.*], A. W. Moore [*F.*], Herbert A. Satchell [*F.*], W. Henry White [*F.*], W. Gilmour Wilson [*F.*].

Science.—Messrs. R. J. Angel, M.Inst.C.E. [*A.*], C. E. Hutchinson [*A.*], F. N. Jackson [*H.A.*], F. T. Reade [*H.A.*], A. T. Walmisley, M.Inst.C.E. [*H.A.*].

BRITISH TRADE WITH SOUTH AFRICA.

His Majesty's Trade Commissioner in South Africa (Mr. R. Southern Holland) proposes to establish, in connection with his office at the Norwich Union Buildings, St. George's Street, a Bureau of Commercial Information, in order that buyers in South Africa may readily be able to obtain the fullest possible information concerning goods manufactured in the United Kingdom. The Board of Trade, therefore, suggest that British manufacturers interested in the South African trade would find it useful to forward to His Majesty's Trade Commissioner the following data, viz.:—Name and address of firm; class of goods manufactured; code address and codes used; terms of payment and discounts; and name and address of South African agents, if any, together with catalogues complete (in duplicate); price lists, photographs, &c. Samples are not desired.

The idea is that anyone in South Africa applying, either personally or by letter, may receive the fullest information concerning goods manufactured in Great Britain and Ireland. In many cases this will result in a great saving of time. Mr. Holland is anxious that it should distinctly be understood that the bureau is not intended in any way to supersede existing arrangements between British firms and their South African agents or independent importers. On the contrary, according to the *Cape Times*, persons in South Africa seeking information will be advised of the names of local firms stocking the particular goods about which inquiry is made.

Mr. Holland is taking particular care to protect the interests of local agents, and makes it clear that he is precluded from taking orders or acting as an agent in any way, and that the work of his office will be limited to furnishing all possible information.

Communications on the subject should be addressed direct to His Majesty's Trade Commissioner, P.O. Box 1346, Cape Town.

H.M. Consul-General at Antwerp (Sir E. C. Hertslet) again draws attention to the public international competition for a scheme for the artistic laying out of the land surrounding Antwerp, which will shortly be left bare on the demolition of the existing fortifications encircling the city. The prizes offered are one of 25,000 francs (1,000*l.*), one of 10,000 francs (400*l*), and one of 5,000 francs (200*l.*). The competition closes at 5 p.m. on October 1 next, up to which time plans, &c., of the proposed scheme will be received by "M. le Président de la Commission d'études de l'aménagement de l'agglomération anversoise, rue du Jardin des Arbalétriers, No. 57," Antwerp. According to the *Board of Trade Journal*, it is understood that it is particularly desired that British architects should take part in the competition. The documents necessary for competitors may be obtained on payment of 100 francs (4*l.*), at the above-mentioned address. A copy of the conditions, &c. (in French) may be seen by British firms at the Commercial Intelligence Branch of the Board of Trade 73 Basinghall Street, London, E.C.

The National Federation of Building Trades Employers of Great Britain and Ireland held their half-yearly meeting at the Chester town hall last week. Mr. S. Smethurst (Oldham), president of the Federation, was in the chair. Nearly 150 representatives were present. Amongst other business it was agreed that a sum not exceeding 100*l.* be contributed from the reserve fund towards the cost of an appeal on a law case which was deemed of great importance. This was described in the report as follows:—"The case, originated in the Northern Counties district, resulted in a decision to the effect that a contract as per quantities is a lump-sum contract. The case arose between a sole contractor and his sub-contractor, the latter tendering to do certain work for a certain sum as per quantities, and the former accepting the tender in similar terms. On completion the sole contractor wished to measure up the whole work and pay for what had actually been done, but the sub-contractor refused, claiming that the contract was for a lump sum, and that only the variations should be dealt with. According to the decision of the High Court Judge the sub-contractor is right."

MANCHESTER SOCIETY OF ARCHITECTS.

The fourth Saturday summer visit took place on July 23, when the members had a long afternoon's sketching at Nantwich. The fourteenth and fifteenth-century parish church, with its beautifully vaulted chancel, fine choir stalls, exquisite buttresses, and well-known octagonal lantern, is one of the architectural gems of Cheshire, and naturally received most attention. Less famous, but deeply interesting in a quiet way, are several examples of domestic work of Georgian and earlier date, which show most admirable proportion and a nice feeling for scale, their architectural charm giving keen pleasure, although realised through the simplest possible means. Mr. A. E. Corbett was the leader.

On the following Wednesday a large number of members under Mr. J. H. Woodhouse's leadership visited "The Acorns," Fallowfield, where, by the kind courtesy of W. L. Behrens, Esq., they enjoyed a unique opportunity of viewing the extensions and alterations to the house by Messrs. T. Worthington & Son, and the wonderful collection of works of Japanese art housed in the galleries, and the fine specimens of furniture and objects of art of many periods and nationalities in the various rooms. It was hardly possible in one short evening to realise the magnitude and priceless value of Mr. Behrens's collection, and time did not allow for the beauty of more than a very small proportion of the thousands of objects to be individually appreciated. The original work of Messrs. Worthington is no less interesting than the skilful way in which the fine old panelling which lines the main gallery, and the great fireplace, have been adapted to the building by the architects.

Afterwards the party proceeded to the "Oaks," the new Hall of Residence for women students of the University, also the work of Messrs. Worthington. One wing of the quadrangle is almost complete, and forms a delightfully grouped building, one of the most striking features of which is the clever and successful use of the various materials employed, Ravenhead bricks, Alderley stone, and Cotswold slates to the roof. The windows are sashes and frames, set near the face of the wall and painted white. The party was conducted over the building by Mr. Percy S. Worthington, M.A., the President of the Society.

The scheme of the Ecclesiastical Commissioners for authorising certain alterations and improvements at the episcopal house of residence belonging to the See of Lincoln, which is known as the Old Palace, Lincoln, has been formally approved by the King.

A faculty has been granted for the enlargement of Hoole Church, Cheshire, by the erection of a south aisle and the erection of two vestries. The work, which includes the provision of new heating apparatus, will cost about 2,740*l.* The plans have been prepared by Mr. Whalley.

Mr. R. D. R. Sweeting, M.D., a medical officer of the Local Government Board, and Mr. A. H. Worsley, A.R.I.B.A., one of the Board's inspectors, held an inquiry at Gateshead town-hall on Friday in reference to objections which had been made to new bye-laws proposed by the Town Council.

The death occurred on Friday, at Willaston, Cheshire, at the age of seventy-one years, of Mr. Thomas Hewson, who was for over twenty-three years the chief municipal engineer of Leeds. During the greater part of that time he had the entire responsibility, and did a large part of the work of three offices, a fact which was fully recognised when, shortly before his resignation in March 1905, the Corporation divided his department into three, the intention being that Mr. Hewson should devote himself exclusively to the work of the city engineer, and a waterworks engineer and a sewerage engineer were appointed, each at a salary of 1,000*l.* a year.

Work is about to commence on extensive additions to the Clarendon Hotel on the Hammersmith Broadway, W., for Mr. H. Foreman. The adjoining premises are to be converted into an entrance hall giving access to a new dining saloon connected with the existing grille room. A small music gallery with balconies into both rooms is so situated that the band will be audible in both rooms. The upper portion of the existing hotel will be taken down, and in connection with the adjoining premises, converted into a masonic lodge room with ante-rooms and banqueting-hall which will be available for private or public dinners and dances. In the basement will be new lavatory accommodation and cloak rooms for both sexes, heating chambers, cold storage, and wine cellars. The work has been entrusted to Mr. A. E. Flexman, and the architects are Messrs. Lovegrove & Papworth, of 22 King Street, Hammersmith, and 374-8 Old Street, E.C.

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Cathedrals and Abbeys of England—continued.

CHESTER.

View from South-East	January 1, 1904
Tower, Flying Arches and Buttresses	January 15, 1904
Mosaics in Aisle	January 29, 1904
The Cloisters. Doorway in Cloisters	February 12, 1904
The Choir	March 25, 1904
Detail of Choir Stalls	April 1, 1904
The Sedilia. Reader's Pulpit in Refectory	April 15, 1904
The Crypt	April 22, 1904
The Nave, looking North-East ...	April 29, 1904
Vestibule to Chapter-House. Window and Door at South End of West Aisle of South Transept...	May 6, 1904
General View of Nave	May 20, 1904
South Cloister. The Cloisters ...	May 27, 1904
West End of South Wall of Refectory, and North-West Angle of Cloisters	June 3, 1904
Clerestory of Nave and Flying Buttresses. North-West Porch and Base of North-West Tower. Doorway at West End of Nave. Abbey Gateway	June 10, 1904
General View of Choir	June 17, 1904
North-East View	June 24, 1904
The Chapter-House	July 1, 1904
South Aisle, The Pulpit	July 15, 1904
The Crossing, looking North-East	July 22, 1904
The Reredos...	July 29, 1904
The Cloisters	August 5, 1904
North-East View. North Transept, with Tomb of Bishop Pearson	August 12, 1904

BANGOR.

General Exterior (South Side) ...	August 19, 1904
Chancel and Nave from Altar ...	August 26, 1904
General Exterior (North Side) ...	September 9, 1904
Interior of Central Tower ...	September 23, 1904
North Side of Choir	October 7, 1904
South Aisle from West End ...	October 28, 1904
General Interior, Nave, and Chancel from West End ...	November 11, 1904
Nave from Chancel	November 25, 1904
South Aisle from East End ...	December 2, 1904
Chancel from Nave	December 9, 1904
North Side of Choir	December 16, 1904

ST. ASAPH.

General Exterior from South-West Corner looking North-East	January 6, 1905
The West Door	January 20, 1905
Interior from West End	February 3, 1905
General Interior from East End	February 17, 1905
Chancel from Nave	March 3, 1905
General Exterior, North Side ...	March 17, 1905
South Aisle from West End looking North-East	March 31, 1905
Nave from Chancel	May 5, 1905
The Altar	June 2, 1905
View across Nave looking South-East	June 23, 1905
The Choir, North Side. Interior of Chapter-House	June 30, 1905

WAKEFIELD.

Chancel and Nave from East End	July 7, 1905
Recent Extension at East End ...	July 21, 1905
Detail of Screen	August 4, 1905
Chancel Arch and Screen... ...	August 18, 1905
The South Choir	September 1, 1905
One of Two Carved Wood Screens, with Doors to the New St. Mark's Chapel... ...	September 15, 1905
orth Choir and New Part of Organ	September 22, 1905
Groined Ceiling, St. Mark's Chapel (Modern)	September 29, 1905
St. Mark's Chapel, West End (recent addition)...	October 6, 1905
Nave and Chancel from West End	October 20, 1905
View from South-East Corner of South Aisle, looking North-West	November 3, 1905

WAKEFIELD—*continued.*

View from North Transept across Sanctuary to South Transept ...	November 10, 1905
Altar and Reredos	November 17, 1905
Part of South Transept	November 24, 1905
St. Mark's Chapel	December 1, 1905
General Exterior	December 8, 1905
The Chancel	December 15, 1905
General Interior, looking East ...	December 22, 1905
Effigy of the late Bishop How ...	December 29, 1905

TRURO.

View of the North Side	January 5, 1906
View of East End from the Bridge	January 19, 1906
The North Side, showing Central Tower and Spire...	February 2, 1906
View from North-West	February 9, 1906
South Choir Aisle	February 16, 1906
Baptistery from the South-West	February 23, 1906
Interior of Baptistery and Font ...	March 9, 1906
View of North Transept	March 23, 1906
West Front, South Porch ...	April 6, 1906
Bishop's Throne and South Side of Choir and Nave	April 20, 1906
East End showing Reredos ...	May 11, 1906
The Sanctuary, High Altar, Reredos and Sedilia	May 18, 1906
Nave and West End with Gallery	June 1, 1906
The Nave, looking West	June 22, 1906
Full Length View, looking East...	June 29, 1906

ST. DAVIDS.

View from South-East	July 6, 1906
West Front and part of ruined College of St. Mary. Exterior of Lady Chapel	July 13, 1906
View of Nave from West Door ...	July 20, 1906
The Choir and Parclose Screen from North-East. The Lady Chapel	August 3, 1906
The Triforium and Clerestory from top of Rood Screen. The Rood Screen	August 10, 1906
From South-West (showing South Porch and South Transept). Exterior from South-East ...	August 17, 1906
The Nave, looking West	August 24, 1906
The Choir, Eastwards	August 31, 1906
Showing North Door. The Choir, Westwards	October 5, 1906
The Choir, Westwards from High Altar	October 12, 1906
View across Nave from South Door. South Choir Aisle from South Transept	October 19, 1906

MANCHESTER.

From South-East	October 26, 1906
New Chapter-House from South-East	November 2, 1906
View across Nave from South-East, showing Double Nave Aisle	November 9, 1906
South-East Corner, showing Old Chapter-House	November 16, 1906
The South Porch and Tower ...	November 23, 1906
Old Chapter-House Door in South Choir Aisle	November 30, 1906
The Choir, Eastwards	December 7, 1906
The Nave, Eastwards	December 14, 1906
The Choir, Westwards	December 21, 1906

CARLISLE.

Exterior from South-West ...	January 11, 1907
Remains of Norman Nave ...	January 18, 1907
Tower and South Transept ...	January 25, 1907
The East Window	February 15, 1907
View of Choir looking East ...	February 22, 1907
South Aisle looking East	March 8, 1907
Exterior of Choir from South-West	March 15, 1907
Exterior from South-East... ...	March 22, 1907
South Transept Door	April 12, 1907
The Choir, Triforium, and Clerestory (South Side)	April 26, 1907
South Aisle looking West... ...	May 17, 1907

CARLISLE—*continued.*

View from South Transept showing Norman Arch	May 31, 1907
View of Choir looking West ...	June 14, 1907
The Choir from Organ Loft (the East End)	June 21, 1907
View across Transepts from South	June 28, 1907

SOUTHWARK.

View of Exterior	July 5, 1907
View of Chancel	July 19, 1907
The New Harvard Chapel. The Gower Monument	August 2, 1907
The Lady Chapel	August 16, 1907
North Side of Chancel, showing Triforium	September 6, 1907
North Transept	September 20, 1907
The Nave from the Chancel ...	October 4, 1907
The Nave, looking East	October 18, 1907
North Aisle	November 15, 1907
North Choir Ambulatory	November 29, 1907
Nave, looking West...	December 6, 1907
North Transept from South ...	December 13, 1907
Fox's Screen	December 20, 907

OXFORD.

The Cloisters and Cathedral ...	January 3, 1908
View from the Garden	January 17, 1908
The Latin Chapel	February 7, 1908
South Transept and Lady Chapel	March 6, 1908
North Aisle	March 20, 1908
The Nave	April 3, 1908
Norman Arch and Cloisters ...	April 10, 1908
The Choir	April 17, 1908
Interior, looking East	April 24, 1908

NEWCASTLE.

View from Castle Ramparts ...	May 1, 1908
Bishop's Throne, and one Bay of Choir Stalls	May 8, 1908
Screen and Sedilia...	May 15, 1908
Choir Screen from West	May 22, 1908
Full-Length View Eastwards ...	May 29, 1908
The Nave, Westwards	June 5, 1908
Organ in North Transept	June 12, 1908
Font and Tower Arch on South Side...	June 19, 1908
Full-Length View Westwards ..	June 26, 1908

SOUTHWELL.

Details of Right-hand side of Chapter-House Door	July 10, 1908
The Chapter-House Door	July 24, 1908
The Sedilia	July 31, 1908
The Rood Screen, East Side ...	July 31, 1908
The Chapter-House, West Side ...	August 7, 1908
The South Nave Aisle	August 21, 1908
The Nave, looking Eastwards ...	August 28, 1908
North Door and part of Norman Arcading in North Porch ...	September 11, 1908
View across Transepts, looking Southward	September 25, 1908
West Front	October 9, 1908

BIRMINGHAM.

From South-West	October 16, 1908
View Eastwards	October 23, 1908
View Westwards	October 30, 1908
The Choir, Eastwards	November 13, 1908
Altar and East Window	November 20, 1908
The Baptistery	November 20, 1908

LLANDAFF.

East End of Lady Chapel... ...	January 7, 1910
West Front	January 14, 1910
Western Towers and Spire ...	January 21, 1910
Interior, looking Eastwards ...	January 28, 1910
From the South-East	February 4, 1910
The Choir, Eastwards	February 11, 1910
South Nave Aisle, from East ...	February 18, 1910
North Side of Choir, Interior ...	February 25, 1910
North Side of Nave	March 11, 1910
The Sanctuary	March 18, 1910
South Door	March 25, 1910
West Door	March 25, 1910

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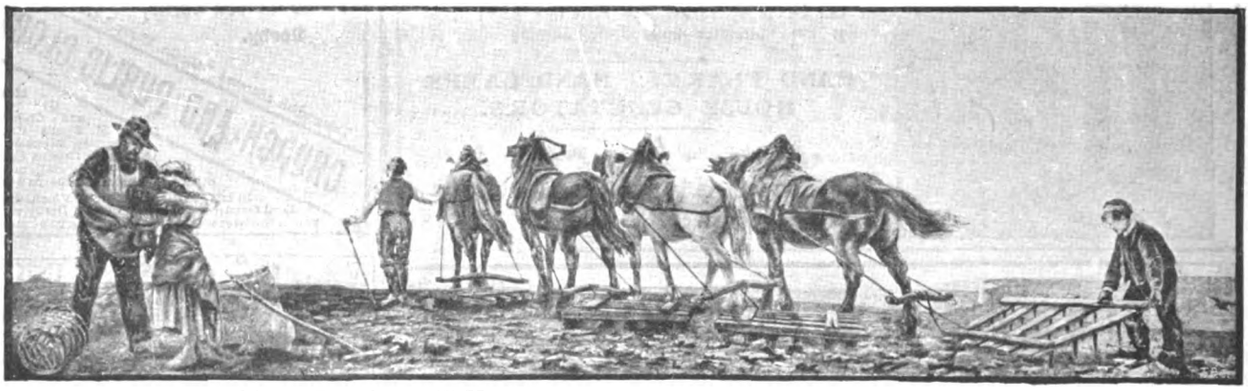
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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 p.m. on Thursdays.*

COMPETITIONS OPEN.

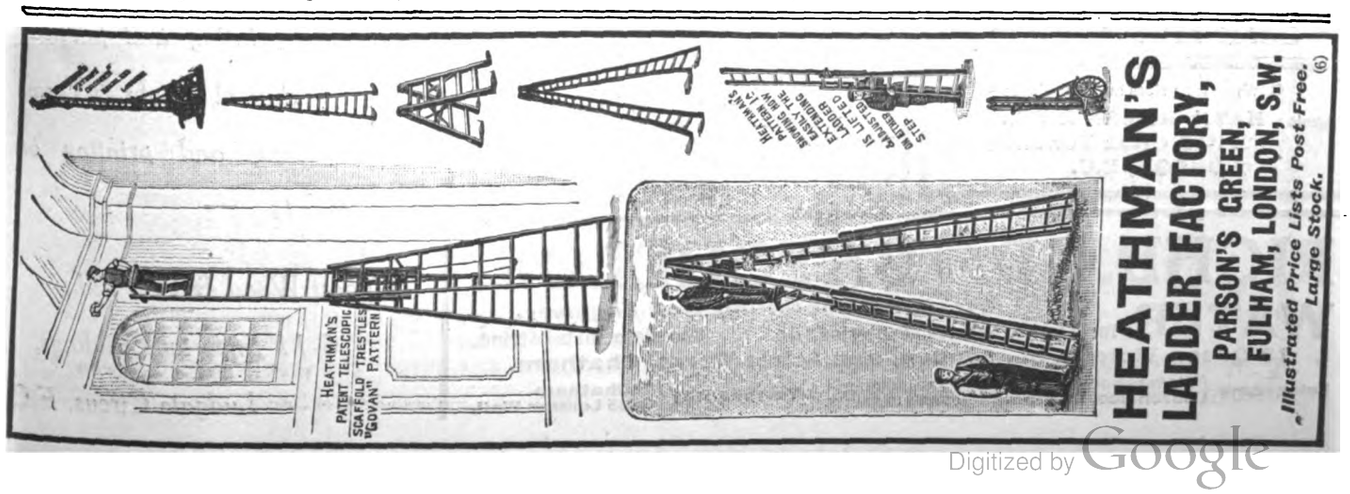
Antwerp.—Oct. 1.—An international competition is being arranged for a scheme for the laying out of the land surrounding Antwerp, which will shortly be available by the demolition of the encircling fortifications. Premiums of 1,000*l.*, 400*l.*, and 200*l.* are offered. Copies of the conditions, &c., may be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C., or, on payment of 100 francs from the "Commission d'études de l'aménagement de l'agglomération anversoise," 57 Rue du Jardin des Arbalétriers, Antwerp.

Belfast.—Sept. 15.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of *bona-fide* design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

Egypt.—Aug. 24.—The Egyptian State Railways Administration propose to hold a limited competition for a new railway passenger station at Alexandria. Architects desirous of taking part in the competition should make application to the Director-General of the Egyptian State Railways, Cairo, not later than noon on August 24, giving information as to their status as architects and a list of the constructions for which they have prepared plans during the last three years. Six architects will be finally permitted to compete. Prizes of 400*l.*E, 200*l.*E, and (two of) 100*l.*E will be awarded for the best plans.

Folkestone.—Sept. 10.—Designs are invited for a secondary school to accommodate 150 boys. Deposit 2*l.* 2*s.* Mr. A. F. Kidson, town clerk, Folkestone.

Gorleston-on-Sea.—August 31.—The Governors of the East Anglian Institution for Blind and Deaf Children invite plans and designs for a new building to be erected at Gorleston-on-Sea. The competition will be confined to architects having an office or residing in the areas of the following education authorities:—Cambridgeshire, Isle of Ely, Lowestoft, Norfolk, Norwich, East Suffolk, and Great Yarmouth. Copies of the instructions to architects within the prescribed areas will be sent on a remittance for 10*s.* (returnable). Documents to be sent back. Mr. D. O. Holme, clerk of the governors, Castle Chambers, Norwich.



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Ireland.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

Ireland.—Sept. 1.—The Kingstown Urban Council offer prizes of 50*l.* and 20*l.* for the best sets of plans for a Carnegie Library to be erected in Lower George's Street. Deposit 1*l.* 1*s.* Mr. J. Sherlock Vaughan, town clerk, Town Hall, Kingstown.

Ruislip.—The Directors of Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

Sheringham.—Sept. 5.—The Urban District Council invite designs for proposed new Council offices. Apply, enclosing a stamped and addressed envelope, to Mr. Edgar C. Rolfe, clerk, Church Street Chambers, Sheringham, Norfolk.

Wales.—Sept. 19.—The town hall committee invite competitive designs, &c., for the proposed alterations and additions (not exceeding in cost 3,000*l.*) to the town hall and market hall, Maesteg. Conditions, with a plan of site and sections at ground level, may be obtained from Mr. Samuel J. Harpur, engineer and surveyor, Town Hall, Maesteg. Two premiums are offered, namely, 25 guineas and 10 guineas, as first and second respectively. The committee do not bind themselves to award the premiums, and they do not intend to engage the authors of the designs for which premiums may be awarded to carry out or supervise the work.

Wales.—Oct. 1.—The Town Council of the borough of Denbigh invite competitive plans and designs of a public hall, markets, municipal buildings, &c., which it is proposed to erect at a cost not to exceed 10.000*l.* Three premiums are offered, viz. 75*l.*, 30*l.* and 20*l.*, as first, second and third respectively. Send 1*l.* 1*s.* deposit for particulars, &c., Mr. J. Parry Jones, town clerk, Denbigh.

CONTRACTS OPEN.

Bacup.—Aug. 20.—For excavating and levelling the playgrounds and building retaining walls at Western Council schools. Mr. W. H. Elce, A.M.I.C.E., borough engineer, Bacup, Lancs.

Banbury.—Aug. 16.—For (1) Conversion of the present receiving ward into a tailor's shop; (2) alterations to the bathroom; and (3) work in connection with the garden paths. The Master of the Workhouse, Banbury.

Bishop Auckland.—Aug. 17.—For making alterations to wards and other rooms in the old infirmary at the Auckland Union workhouse, for the Guardians of Auckland Union. Mr. F. H. Livesay, architect, Bishop Auckland.

Bristol.—Aug. 18.—For erection of a new post office at Temple Meads. Deposit 1*l.* 1*s.* The Postmaster, Bristol; or H.M. Office of Works, Storey's Gate, London, S.W.

Burnley.—Aug. 24.—For the erection of a new elementary school, to accommodate 300, at Hapton, near Burnley, for the Lancashire education committee. Deposit 2*l.*, returnable. Mr. Henry Littler, architect, 16 Ribblesdale Place, Preston.

Dewsbury.—Aug. 13.—For erection of a residence in Healds Road. Send names by Aug. 13 to Messrs Barton & Son, architects, Halifax Road, Dewsbury.

Dublin.—Aug. 18.—For erection of courthouse at Rathfarnham (proposal 6,703), and for re-erection of beacon, removal of outlying rock, completion of the excavation of the approach channel, and sundry works in connection with the improvement of Loughshinny pier (proposal 6.704), for the Dublin County Council. Mr. R. T. Blackburne, secretary, Dublin County Council, 11 Rutland Square, Dublin.

Dublin.—Aug. 20.—For erecting and completing an addition to the cloth stores at the Royal Irish Constabulary Depot, Phœnix Park. Mr. H. Williams, secretary, Office of Public Works, Dublin.

Dublin.—Sept. 1.—For erecting a nursing home in connection with St. Vincent's Hospital, Stephen's Green, Dublin. Deposit 3*l.* 3*s.* Messrs. W. H. Byrne & Son, architects, 20 Suffolk Street, Dublin.

Edale.—Aug. 13.—For the enlargement and alteration of the school at Edale, Derby. Send names, not later than Aug. 13, to Messrs. Currey & Thompson, architects, Market Place, Derby.

Felixstowe.—Aug. 26.—For erection of an isolation hospital, with administrative, disinfecting, and laundry blocks. Deposit 2*l.* 2*s.* Mr. H. Clegg, A.M.I.C.E., Town Hall, Felixstowe.

Flushdyke.—Aug. 20.—For the various trades in connection with erection of the Flushdyke new Council school, for the Ossett Educational Authority. Deposit 1*l.* Send names by Aug. 20 to the Secretary, Education Department, Town Hall, Ossett.

Gloucester.—Sept. 10.—For proposed additions to Sir Thomas Rich's school. Send names by Aug. 20 to Mr. Walter B. Wood, architect, 12 Queen Street, Gloucester.

Greatham.—Aug. 20.—For the erection of a Council school for 120 children. Mr. W. J. Taylor, county surveyor, Winchester.

Grimsby.—Aug. 20.—For alterations and additions to St. John's Assembly Rooms, Cleethorpe Road. Rev. F. M. Blakiston, St. John's Vicarage, Grimsby.

Halifax.—Aug. 25.—For the various trades in alterations to premises for branch bank, at the junction of Town Hall Street and Hollins Mill Lane, Sowerby Bridge, for the Halifax Commercial Banking Company, Ltd. Mr. Thos. Kershaw, A.R.I.B.A., architect, Lancs. and Yorks. Bank Chambers, Halifax.

Horden Colliery.—Aug. 17.—For erection of a church at Horden Colliery, Durham. Deposit 3*l.* 3*s.* Messrs. Joseph Potts & Son, architects and surveyors, 57 John Street, Sunderland.

Ireland.—Aug. 17.—For the erection of additions to the County Court House, Nenagh, the cost not to exceed 900*l.* The County Surveyor, Court House, Nenagh.

Knypersley.—Aug. 23.—For erection and completion of a Council school for 350 children and a handicraft centre, at Knypersley, in the parish of Biddulph, Staffordshire. Deposit 1*l.* 1*s.* Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Leeds.—Aug. 15.—For the whole or any portion of the works required in erection of shop, house, and stabling adjoining the Hope Inn, North Street. Forward names and trades by Aug. 15 to Mr. W. Mason Coggill, architect, 4 Airedale Terrace, Stourton, Leeds.

Little Hulton.—Aug. 18.—For the erection of new quarters for the Territorial Company at Little Hulton, Bolton. Deposit 1*l.* 1*s.* Mr. J. P. Fraser, architect, 14 Elliot Street, Liverpool.

London.—Aug. 15.—For erection of a block of buildings in Great Portland Street, W. Deposit 3*l.* 3*s.* Mr. Ernest G. Verity, surveyor, 7 Great Marlborough Street, W.

Macclesfield.—Aug. 15.—For the roofing of cattle pens, auction ring and fencing on Waters Green. Deposit 1*l.* 1*s.* The Borough Engineer's Office, Town Hall.

Macclesfield.—Aug. 23.—For erection and completion of a public elementary school building, play sheds, boundary fences and other works in connection therewith, on land in Byron Street. Messrs. Whittaker & Bradburn, architects, 19 King Edward Street, Macclesfield. Send 2*l.* 2*s.* deposit to Mr. Arthur T. Pattinson, clerk to the Education Committee, District Bank Buildings, Macclesfield.

Minchinhampton.—Aug. 20.—For straightening the wall between the camp field and Seymour House, length about 200 yards. Mr. F. E. Jones, Minchinhampton.

Newcastle-under-Lyme.—Aug. 24.—For erection of a post office. The Postmaster, Newcastle-under-Lyme, or H.M. Office of Works, Storey's Gate, London, S.W.

Nantwich.—Aug. 23.—For erection of seven single dwelling-houses and six sets of farm buildings on the Batherton Estate, near Nantwich, Cheshire. Deposit 1*l.* The County Estate Office, 49 Northgate Street, Chester.

Old Hartley.—Sept. 3.—For erecting new out offices, constructing a drainage system, &c., at Old Hartley Council school, Northumberland. Deposit 1*l.* 1*s.* Mr. C. Williams, secretary to the education committee, the Moothall, Newcastle-on-Tyne.

St. Helens.—Sept. 12.—For erection of a secondary school for boys in Cowley Hill Lane, St. Helens, Lancs. Deposit 1*l.* 1*s.* Mr. Frank S. Biram, architect, George Street, St. Helens.

Scotland.—Aug. 15.—For the mason, carpenter, slater, plumber, plaster, painter and glazier works in connection with extension of business premises at East Church Street, Buckie, for Mr. James Mackay, draper. Mr. William Hendry, architect, 91 West Church Street, Buckie.

Scotland.—Aug. 18.—For the mason, carpenter, plumber, slater, plaster and painter and glazier works of additions and

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alterations to the hall lately used as the Drill Hall at Bucksburn. Mr. George J. Milne, architect, 137 Union Street, Aberdeen.

Scotland.—Aug. 25.—For the following works in the erection of a lodging-house on main road between Torryburn and Culross, viz.—mason, joiner, plumber, slater, and plaster works. Messrs. Wm. & C. Scott Gullen, architects, 83 High Street, Cowdenbeath.

Scotland.—Aug. 25.—For carrying out additions and alterations to the Post Office, Johnstone, Renfrewshire. The Post Office, Johnstone, or H.M. Office of Works, 3 Parliament Square, Edinburgh.

Scotland.—Aug. 25.—For alterations and additions to Motherwell Post Office. Deposit 1*l.* 1*s.* The Post Office, Motherwell, or H.M. Office of Works, 3 Parliament Square, Edinburgh.

Southend-on-Sea.—Aug. 13.—For erection of the Westborough Council school, consisting of three departments (1,200 places). Deposit 2*l.* 2*s.* Send in names and addresses by Aug. 13 to Mr. Percy Brockbank, architect, County Chambers, Weston Road, Southend-on-Sea.

Stafford.—Aug. 20.—The Staffordshire education committee are prepared to receive tenders for the supply of school furniture, for a period of one year. The Director of Education (Requisitions Department), County Education Offices, Stafford.

Stannington.—Aug. 23.—For the foundation works and erection of twelve cottages at Stannington, near Morpeth, for the Committee of Visitors of the Gateshead Asylum Deposit 5*l.* Messrs. J. P. Allen & Partners, surveyors, Grainger Street West, Newcastle-on-Tyne.

Stone.—Aug. 23.—For erection and completion of combined cookery, laundry-work and handicraft centres, with class-rooms, &c., at Stone, Staffordshire. Send 1*l.* 1*s.* deposit to Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Scotland.—Aug. 18.—For the mason, carpenter, slater, plasterer, and reinforced work, plumber, heating, and painter and glazier works of a new public school to be erected in Tarves, for the Tarves School Board. Mr. James Cobban, architect, Haddo House.

Wales.—Aug. 15.—For alterations and additions to the Masonic Hall premises, Newport, Mon. Messrs. Swalwell & Havard, architects, 202 Dock Street, Newport, Mon.

Wallasey.—Aug. 16.—For the supply of 70,000 wood paving blocks (Jarrah and creosoted Baltic red deal alternatively). Mr. W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire.

Wales.—Aug. 17.—For the construction of an underground convenience on the West Shore, Llandudno. The Engineer, Town Hall, Llandudno.

Wales.—Aug. 17.—For erection of a police-station at Sketty, Glamorganshire. Mr. J. Jones Lewis, 7 Rutland Street, Swansea, solicitor, and the Glamorgan County Council Offices, Westgate, Cardiff.

Wales.—Aug. 17.—For re-slating St. Illtyd's Church, Williamstown, Penygraig. Rev. D. H. Simon, the Vicarage, Penygraig.

Wales.—Aug. 19.—For erection of a pair of cottage homes for children at Cwmbach, Aberdare, for the Guardians of Merthyr Tydfil Union. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

Wales.—Aug. 19.—For erection of three shelters at the Union Workhouse, Merthyr Tydfil. Mr. Thomas Roderick, architect, Clifton Street, Aberdare, or the Master at the Workhouse.

Wales.—Aug. 20.—For erection of a Council school, to accommodate 400 children, at Sebastopol, Panteg, near Pontypool. Deposit 1*l.* 1*s.* Mr. John Bain, F.R.I.B.A., County Council Offices, Newport.

Wales.—Aug. 22.—For erection of twenty-four houses at Penpedairheol, Gelligaer, for the Rhosyfedw Building Club. Deposit 1*l.* 1*s.* Messrs. Johnson & Richards, architects, Merthyr Tydfil.

Wales.—Aug. 23.—For the erection of a drill hall and quarters for the 1st Welsh Field Ambulance, Ebbw Vale, Mon. Deposit 2*l.* 2*s.* Mr. H. Waters, M.S.A., architect, Ebbw Vale, Mon.

Wales.—Oct. 1.—For building a school (accommodation 500) at Hendy, Pontardulais, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., County Architect, County Education Offices, Carmarthen.

Warrington.—Aug. 19.—For the erection of a public elementary school. Mr. J. Moore Murray, secretary, Sankey Street, Warrington.

Workington.—Aug. 17.—For the whole of the work required in the erection and completion of a technical and secondary school at Workington, Cumberland. Deposit 2*l.* 2*s.* Messrs. Clark & Moscrop, architects, Darlington, or the County Education Offices, The Courts, Carlisle, and the Town Hall, Workington.

Wye.—Aug. 15.—For the execution of summer repairs at the Wye infants' Council school, Kent. Mr. J. Creery, correspondent, 11 Bank Street, Ashford, Kent.

TENDERS.

BOGNOR.

For erection of Congregational Sunday-schools. Mr. E. J. Hamilton, architect, Brighton.

Seymour	£1,969 9 0
Barnes & Sons	1,792 0 0
W. & T. Garrett	1,782 0 0
Burrell & Standen	1,766 0 0
Hockley & Co.	1,663 0 0
Linfield & Sons, Littlehampton (*accepted*)	1,659 0 0

CARSHALTON.

For repairs and alterations to roads, and paving work at the Children's Infirmary, Carshalton, Surrey, for Metropolitan Asylums Board. Mr. W. T. Hatch, M.Inst.C.E., M.I.Mech.E., engineer-in-chief.

Wainwright & Co., Ltd.	£6,150 0 0
Trueman, Ltd.	5,850 0 0
Wort & Way	5,595 0 0
Laing	5,350 0 0
Constable, Hart & Co., Ltd.	5,273 0 0
Adams	5,200 0 0
Griffiths & Co., Ltd.	5,183 0 0
Cropley Bros., Ltd.	4,990 0 0
Roadamant Co., Ltd.	4,964 19 1
Kavanagh & Co.	4,885 0 0
Tarmac, Ltd.	4,750 0 0
Wall	4,328 0 0
Grounds & Newton, S. Tottenham (*accepted*)	4,125 0 0

For erection of economiser house, construction of trenches, and other incidental works at the Children's Infirmary. Mr. W. T. Hatch, M.Inst.C.E., M.I.Mech.E., engineer-in-chief.

Pasterfield & English	£7,163 0 0
Nightingale	5,200 0 0
Turtle & Appleton	4,928 0 0
Hussey	3,999 0 0
Kazak	3,910 0 0
Wall, Summerstown, Tooting (*accepted*)	3,800 0 0

CLIFFE.

For the erection of the Cliffe new infants' Council school, for the Kent Education Committee. Mr. Wilfrid H. Robinson, M.S.A., architect.

West Bros.	£1,237 0 0
Lawrence	1,130 0 0
Archer & Son	1,130 0 0
Seager	1,115 0 0
Tong	1,093 0 0
Gates & Sons	1,085 0 0
Baker & Son	1,064 0 0
Reeves	1,042 0 0
Bowes	930 0 0
Skinner, Chatham (*recommended*)	892 0 0

EAST STONEHOUSE.

For alterations, &c., at the workhouse infirmary. Messrs. Thornby, Rooke & Barron, architects, Plymouth.

Debnam	£1,412 0 0
Trevan	1,378 0 0
Smith & Son	1,329 15 0
Cockerell	1,328 0 0
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Andrews	1,185 0 0
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Coles	1,172 0 0
Pearn Bros., Plymouth (*accepted*)	1,145 0 0
Porter	1,091 10 7
Carwithen	920 0 0

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LONDON.

For sewage works in Park Street, Burlington Street, St. Anne's Court, and Vauxhall Bridge Road, Westminster.

Allen & Sons	£2,754 3 11
Rogers & Co.	2,658 0 0
Latter	2,618 8 8
Ewart	2,500 0 0
Muirhead & Co.	2,485 1 0
Boyer	2,398 0 0
Mowlem & Co., Ltd.	2,377 0 0
PATERSON (*accepted*)	2,277 1 0

For making up the roadway of Barlby Road, W., being 2,000 linear feet or thereabouts, and for the construction of about 1,300 feet of 3 feet 9 inches by 2 feet 6 inches brick sewer in the roadway, for the Kensington Royal Borough Council.

Higgs & Hill	£6,844 0 0
Pedrette	6,440 0 0
E. & E. Iles	5,640 15 0
Westminster Construction Co.	5,603 0 7
Mears	5,300 0 0
Ford	4,995 0 0
Patterson	4,994 0 6
Rogers & Co.	4,983 0 0
Wimpey & Co.	4,918 1 10
Brummell	4,808 3 10
Latter	4,767 7 4
Jackson	4,741 10 3
Mowlem & Co.	4,671 0 0
Gibbons (*recommended*)	4,210 0 0
Borough Engineer's estimate	5,098 0 0

For structural works in the formation of an inclined road to the refuse destructor installation at Wood Lane Depot, for the Kensington Royal Borough Council.

Mowlem & Co.	£702 0 0
Holliday & Greenwood	697 0 0
Minter	658 0 0
Abbott & Charlton	620 19 5
Roberts & Co.	620 0 0
Holloway Bros.	617 0 0
Higgs & Hill	614 0 0
Leslie & Co.	597 0 0
King & Son (*recommended*)	585 0 0
Borough Engineer's estimate	583 0 0

LUTON.

For erection of a Carnegie library.

Vail & Shore	£4,969 0 0
Saint	4,857 0 0
Dumpleton	4,818 5 6
Goodchild & Jeffrey	4,739 11 0
Honour & Son	4,711 13 3
Ensor & Ward	4,691 0 0
Martin	4,609 0 0
Dunham	4,578 0 0
Miskin & Sons	4,575 0 0
J. & M. Patrick	4,558 0 0
W. & D. Wilkins	4,498 0 0
Hunt & Son	4,466 0 0
Allen & Sons	4,454 0 0
Fitch & Cox	4,449 0 0
F. & G. Foster	4,448 0 0
Ekins & Co.	4,440 0 0
Henson & Son	4,418 0 0
Lewin & Son	4,397 0 0
Lawrence & Son	4,392 0 0
Nightingale	4,346 0 0
Brown & Son	4,327 5 0
Flint, Nash & Co.	4,327 0 0
DREVER, Kettering (revised tender) (*accepted*)	3,984 15 1

NEW MALDEN.

For erection of Church schools at Kingston Road. Messrs. VINCENT DAVISON & NICOL, architects, New Malden.

Streeton	£820 0 0
Smith	760 0 0
Burgess & Son	743 0 0
Holloway	737 0 0
Fireproof Partition Co.	725 0 0
Nightingale	695 0 0
Scofield & Sons	665 0 0
Boone	615 0 0
Pinney	599 10 0
Potterton	598 17 6
BLISSENDEN, Merton (*accepted*)	568 0 0

NUNEATON.

For the construction of three detritus and humus tanks, and underdrainage at the Hartshill Sewage Disposal Works. Mr. F. C. COOK, A.M.Inst.C.E., borough engineer, Nuneaton.

Dix & Co.	£3,061 16 7
Braithwaite & Co.	2,870 16 4
Palmer	2,829 2 10
Johnson Bros.	2,743 0 0
Morley & Sons	2,605 2 2
Hyslop	2,597 8 9
Nowell & Sons	2,572 1 5
Jewell	2,354 3 4
Brown	2,301 0 0
HICKMAN, Market Harborough (*accepted*)	1,938 9 10

PAIGNTON.

For alterations to shop premises, 4 Gurston Terrace. Messrs. WM. VANSTONE & SONS, architects and surveyors, Paignton.

Pethick Bros., Ltd.	£644 0 0
Roberts, Ltd.	499 0 0
Webber & Sons	462 0 0
WEBBER, Paignton (*accepted*)	460 10 0

SCOTLAND.

For the erection of the Hamilton Academy, N.B., for the School Board.

Accepted tenders.

Anderson & Sons, mason	£17,903 7 10
Ritchie & Anderson, joiner	7,976 17 9
Black, plasterer	2,214 18 11
Spiers & Sons, plumber	2,064 9 4
Brown & Son, tilework	1,777 6 8
Torrance, electric lighting and wiring	1,555 0 0
M'Laren, painter	720 1 2
M'Ghie, slater	620 0 0
Fleming Bros., steel roofing	576 13 6
Kemp, glazier	388 2 9

SWANLEY (KENT).

For cleaning and painting works at White Oak School, for the Metropolitan Asylums Board. Mr. W. T. HATCH, M.Inst.C.E., M.I.Mech.E., engineer-in-chief.

Kreble	£2,057 7 2
Renshaw	1,849 0 0
Vigor & Co.	1,689 0 0
McCarthy	1,440 0 0
Milton Bros.	1,430 0 0
Proctor & Sons	1,388 17 6
Nightingale	1,327 0 0
Payne & Sons	1,301 0 0
KAZAK, 3 and 4 Station Road, Belvedere (*accepted*)	1,126 10 0

WATFORD.

For erection of a children's home in the Ashby Road. Mr. C. P. AYRES, architect, Watford.

Strong & Co.	£2,119 0 0
Ambrose	2,112 0 0
Moss & Sons	2,069 0 0
Paul	2,067 0 0
Lown & Co.	2,025 0 0
Rowland Bros.	1,999 0 0
Weibking & Co.	1,990 0 0
Thomas & Edge	1,974 0 0
Vail & Shore	1,967 0 0
Fitch & Cox	1,959 0 0
Bracey & Clarke	1,930 0 0
Lawrence & Sons	1,925 0 0
Tyler	1,924 0 0
Hacksley Bros.	1,912 0 0
Brown	1,867 0 0
Brightman & Son	1,829 0 0
G. & J. Waterman	1,799 0 0
A. E. & C. Saw	1,799 0 0
Murray & Son	1,794 0 0
Eames	1,779 0 0
Ensor & Ward	1,774 0 0
Clark Bros.	1,746 0 0
Flint, Nash & Co.	1,737 0 0
Honor & Son	1,710 0 0
W. & D. Wilkins	1,695 0 0
KING & SONS, Watford (*accepted subject to the approval of the Local Government Board*)	1,679 0 0

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WALES.

For the erection of new drill hall, armoury, lecture rooms, caretaker's house, boundary walls, &c., at Saundersfoot, for the Pembrokeshire Territorial Force Association. Mr. J. Preece James, architect, Tenby.

Richards & David	£1,640	0	0
Davies & Griffiths	1,487	0	0
Thomas Bros.	1,481	0	0
Parry	1,431	0	0
Poole	1,422	0	0
Thomas & Son, Tenby (*accepted*)	1,391	10	0

For alterations, repairs and drainage at Tenby, for the Charity Trust Estate. Mr. J. Preece James, architect, Tenby.

Davies	£280	0	0
Hart & Lewis	235	0	0
Thomas & Son	210	0	0
Beynon Bros.	207	0	0
Thomas, Tenby (*accepted*)	204	0	0

JERUSALEM'S ANCIENT WATER SUPPLY.

In connection with a scheme now under discussion by the municipality of Jerusalem for an improved water supply, the United States Deputy-Consul (Mr. John D. Whiting), in a report to his Government, furnishes an interesting account of Jerusalem's ancient water supply. Jerusalem to-day, with its 80,000 inhabitants, he says, depends almost entirely on rain for its water supply, the rainfall averaging about 27 inches a year. Water thus collected and stored is good as long as roofs and cisterns are kept clean. In many cases they are filled with surface water, and the insanitary elements with which the water thus collected is impregnated are held responsible for a large percentage of the fevers and other diseases prevalent towards the end of the dry season. At various times since the days of King Solomon efforts have been made to secure a water supply on which the city could depend. About 7½ miles to the south, a little by west, of Jerusalem, on the carriage road to Hebron, are three enormous reservoirs known as Solomon's Pools. These were constructed in the bed of a valley, across which heavy walls were thrown and cemented, and are large enough to contain three million gallons of water. They were filled during the rain season with water from the surrounding hills, and this was augmented by the inflow of a small spring a little higher in the valley, known as the "Sealed Fountain," and some other small springs. From these pools there was a masonry aqueduct built, said to have been the work of Solomon, which, winding around the hillsides, carried the water to the Temple in Jerusalem. At one point this conduit went through a mountain by a tunnel. In the sixteenth century of our era the Mohammedans remodelled this aqueduct by replacing the open trough with pottery pipes, portions of which are still in use. In the second century the Romans, probably under Pontius Pilate, began to carry into execution a most ambitious scheme for bringing a large water supply into the Holy City, but which they seemingly were never able to finish. Their source of supply was Ain Arroub, a large fountain which is also on the road to Hebron and about twice as far from Jerusalem as the Pools of Solomon, whose water was led into the middle of Solomon's Pools. The present scheme is to pump water from Ain Farrah, a fountain about twelve or thirteen kilometres to the north-east of Jerusalem, and 500 metres lower. The water is of the best quality and gushes out from beneath the solid rock cliffs.

The Salford Town Council have agreed to the erection of a new secondary school for boys, at an estimated cost of 16,800*l.*

The Lincoln City Council have agreed that so much of the site of the Grey Friars as may be required for the new public library will be handed over for that purpose. Mr. A. Carnegie has promised 10,000*l.* towards the cost of the building.

The Imperial Trade Correspondent at Toronto (Mr. F. W. Field) reports that a firm at that place desire to obtain the representation of British manufacturers of building supplies, and more particularly those made to architects' details, such as terra cotta, metal frame, and ornamental ironwork. The name and address of the firm may be obtained by British manufacturers on application to the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C., but any further communication with regard to this inquiry should be addressed to Mr. F. W. Field, 380 Victoria Street, Toronto.

SOME DIFFICULTIES ARISING UNDER THE PUBLIC HEALTH (BUILDING IN STREETS) ACT, 1888.*

Since the formation of my district some six years ago many questions have arisen in connection with the administration of this Act, and this must be my reason for bringing this paper before the Conference. The subject is, perhaps, somewhat technical, but nevertheless of considerable importance, especially in districts similar to my own, which are in a transition state between country and town.

The Act has no application in rural districts at all, and prior to the conversion of the parish into an urban district damage had consequently already been done not only to its amenity but to adjoining property. It must be remembered that even urban councils have no power under the general law to fix a building line in any street (except under the exceptional circumstances provided for by section 155 of the Public Health Act, 1875, but to which it is unnecessary to refer here).

In order to make my points clear I think I cannot do better than take a concrete case which frequently occurs in such districts as mine. I will, therefore, assume that a building owner commences to lay out his estate, which abuts on a highway, by dividing it into building plots of a certain depth and frontage, arbitrarily fixes a "building line," say, 30 feet from the highway, and his purchasers or lessees covenant with him not to erect buildings in front of this line. I will further assume that there is at one end or somewhere on the property an old cottage, or possibly an old farm-house, which is described in the particulars of sale as "a quaint old-fashioned cottage easily convertible into a charming week-end retreat."

The Council receive plans of the first new house to be erected on one of the plots situate, say, about 200 feet from the old cottage, which we may imagine is 55 feet back from the road.

I may here state that it seems to me desirable that the Council should never treat as applications for their consent merely submission of plans showing the proposed building in front of the adjoining buildings, but that the owner of the proposed building should formally apply in writing for the Council's written assent under the Act. In the event of the application being made it is more or less an admission that the case falls within the provisions of the Act.

The material section (3) of the Act is as follows:—

"It is hereby enacted that it shall not be lawful in any urban district without the written consent of the urban authority, to erect or bring forward any house or building in any street or any part of such house or building beyond the front main wall of the house or building on either side thereof in the same street, nor to build any addition to any house or building beyond the front main wall of the house or building on either side of the same."

When the application is considered by the Council the following questions at once arise: (1) Is the road "a street"? (2) Is the old cottage in the street? (3) Is the old cottage "a house on either side" within the meaning of the Act? (4) Assuming that all these questions are answered in the affirmative, should the Council consent? If any one of the first three questions is answered in the negative, presumably the Council will adopt one of two courses, either they will consent, or inform the building owner that they are of opinion that the Act does not apply.

To deal with the first question, I have put forward:—

For the purpose of the Act it would appear that under the combined application of section 2 thereof, and section 4 of the Public Health Act, 1875 (the definition section) there could be little doubt that the road in question is "a street," and that the Act so far applies; but the case of "R. *v.* Ormesby Local Board" decided that in order to make the road a street there must be a continuous line of buildings on the same side of the road as the proposed building. This was, however, somewhat modified in a later case, in which it was held that whether a road is a street within the meaning of the Act is a question of fact, and also of degree, as it may be a street at one end, though at the other still a country road.

The second question is even more difficult, and several varying decisions have been given affecting it:—

It has been held that where houses on one side of a proposed new building were set back 62 feet from the roadway, and it was proposed to erect the new house at a distance of

* A paper by Mr. Edmund R. Abbott, Solicitor and Clerk to the Ruislip-Northwood Urban District Council, read at the Conference of the Urban District Councils Association at Ilfracombe.

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21 feet only from the roadway so as to project in front of the other houses, the latter were not on the facts houses in the same street on the side of the proposed new house, and the Council was ordered to approve the plans.

On the other hand, it has been held by the Court of Appeal that houses 30 feet back from the road were undoubtedly in the street for the purpose of the Act.

This question of the approval of plans seems to involve a difficulty which, perhaps, may be elucidated in the discussion upon this paper.

The plans submitted are usually those which are required to be submitted pursuant to the Council's by-laws, and in accordance therewith such plans must show the position of the adjoining properties—assuming that the plans comply with the by-laws in all respects but contravene the provisions of the Act, is the Council entitled wholly to disapprove them? In effect it would appear that they are so entitled, having in view the decision above referred to.

As to the third question, viz., the distance of adjoining houses. It has been held that a house 800 feet from the proposed building is too far to be considered, and similarly houses even from 300 to 400 feet away. It has been also held that "house on either side thereof" means "a house within some near distance within some degree of proximity, and not one standing a considerable distance away," a very vague statement. A short time after this decision, however, it was held by the Court to be "a question of fact" whether the houses are sufficiently near to the proposed building.

The Courts seem to have somewhat despaired of laying down any definite line upon the above points, and in the latest case, "Rex *v.* Chiswick Urban District Council," 1908, it was decided that the Court would not issue a mandamus to compel a council to approve plans which they have in good faith declined to approve in consequence of their contravening the provisions of the Act.

Local authorities are therefore thrown back upon the exercise of their discretion, which is my fourth question, and perhaps the most difficult of all.

Primarily the Act is a Public Health Act, and it is presumably for the purpose of securing proper light and air about buildings, and may one say a certain symmetry in the street? But it must not be forgotten that the adjoining owners are very much interested in the matter.

For instance, no householder desires to look out of his drawing-room windows on to his neighbour's backyard.

The question then arises, how far should adjoining owners be considered or consulted? In London the London County Council insist upon notice being given to each of the adjoining owners of the application to build in advance of the adjoining buildings, and I believe some councils insist upon the person applying for sanction to bring forward obtaining the actual written consent of the adjoining owners before giving their own consent.

This latter procedure seems to place the Council in a somewhat undignified position, as they really delegate their powers to private persons who might use them for the purpose of extorting money from the applicant, whose land might be rendered almost useless by his being prevented from bringing forward his building even a few feet.

I have heard it said that because one man chooses to build his house in his back garden, that is no reason why his neighbours should have to do the same, possibly to the detriment of their property.

This is, of course, an exaggeration, but from the point of view of the local authority, one cannot but feel that it is in the interest of health, amenity, and appearance, especially in these days of motor traffic, that builders should be encouraged to set back their houses as far as possible from the roadway, giving due consideration to the provision of ample space in the rear of the buildings.

In a certain road (technically a street) in my district there are some seven houses set back a hundred feet from the roadway, and certainly from the point of view of amenity there can be no question that such an arrangement is desirable. No hardship could be inflicted on any owner, as the plots are at least 400 feet deep; but under the earlier decisions the Council could not probably have prevented one house from being brought forward and thus spoiling the whole effect; but I hope that the decision in the Chiswick case above quoted will be strong enough to avert any variation from a building line similar to this.

I have refrained from touching upon the question as to what is "the front main wall of the house or building on either side," as this is a purely technical question of fact.

I think, however, I have said enough to show to the Conference some of the difficulties which arise in the administration of this practically one-section Act of Parliament, and it will be seen how difficult it is to lay down principles which would enable the Council to deal with the concrete case I have mentioned. Dealing with every case on its merits is not altogether satisfactory.

Is it possible to suggest a remedy?

In my opinion, the best remedy would be to allow the local authority to prescribe a building line in every street or road. This could be decided after hearing the views of property owners, and the line shown upon a plan which would be open to public inspection. Everyone about to build could ascertain the prescribed line, and any owner who built to the rear of this line would not expect any protection from the Council.

Is it likely that such a remedy will be obtained by Act of Parliament? The experience of local authorities in the matter of "What is a sewer" is not encouraging.

There is, however, now the Housing, Town Planning &c., Act of last year, and under that Act the Local Government Board have power to deal with the following matters by general provisions: "Streets, roads, buildings, structures, and erections."

I venture to submit to the Conference the following motion:—

"That this Conference of Urban District Councils of England and Wales is of opinion that in any town planning scheme approved by the Local Government Board the responsible authority should have power to fix a building line in all streets and roads beyond which no buildings other than walls or fences of such a height as may be prescribed by the scheme shall be erected."

PART OF FACADE OF A HOUSE NOW IN THE V. AND A. MUSEUM, FORMERLY AT ENFIELD.

Very few particulars of this fine piece of brickwork are available, except that it formed part of a house at Enfield which was once a celebrated school at which the poet John Keats, the composer Edward Holmes, and the writer C. Cowden Clarke received their education. A small print in the museum shows the portion measured to have been part of the first floor façade, and describes the building as a railway station.

It is built of soft hand-made red bricks of a pleasing texture, put together with thin joints. The enriched portions have been built in solid brickwork, with horizontal joints, and evidently all carving was done in situ. In the carving the joints seem to have been ignored, and the material treated just as if it were stone. The carving in the niches is beautifully modelled, and finished with a fine surface, as also in the case of the swags. None of the capitals are complete, all the volutes being broken off and some of the leaves considerably damaged. The swags and cupids are really in a very well-preserved state, and the whole is an interesting example of brick treatment.

The local committee for church extension in the Three Towns have approved the plans prepared by Mr. W. D. Caroe, for the church of St. Boniface, St. Budeaux. The new church of St. Gabriel's, also built from plans prepared by Mr. W. D. Caroe, was dedicated last week.

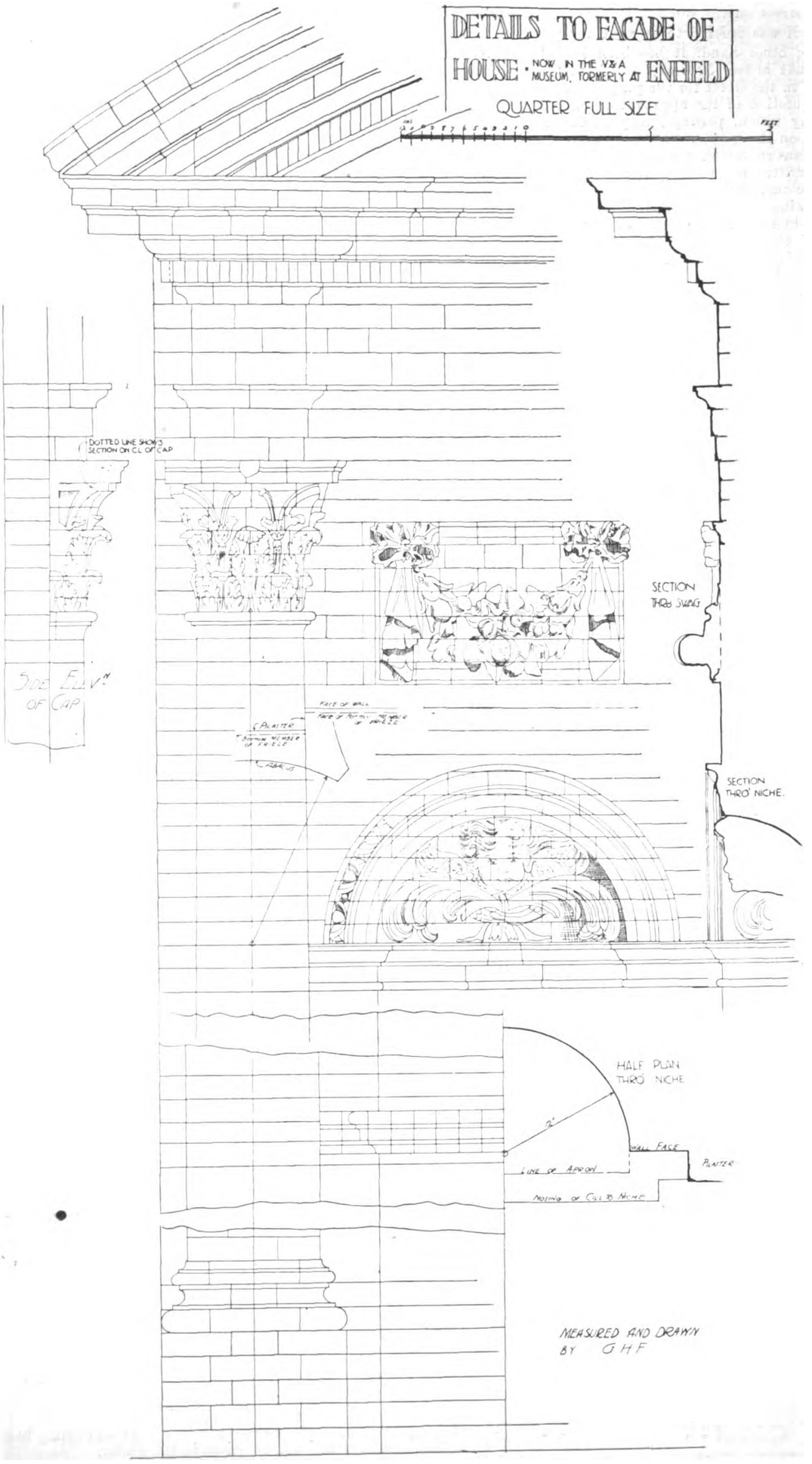
The Pontefract Corporation have decided to advertise for sites for building workmen's dwellings, and not to proceed with the Horsefair improvement scheme on account of the expense already incurred by the owners on the property involved.

The foundation stones were laid on the 4th inst. of the rigid cantilever suspension bridge in course of construction across the river Tees at Middlesbrough. The 50-ton car will travel from bank to bank. The total cost will amount to about 80,000*l*. The designing engineers are the Cleveland Bridge Company, and the work is being carried out by Sir William Arrol & Co.

A spacious swimming bath has been added to the Madeley Street buildings at Hull, at a cost of 8,300*l*. The new building is 110 feet by 76 feet, the swimming tank being 90 feet by 30 feet. Accommodation in the form of an amphitheatre is provided for about 1,200 spectators, and a lofty steel roof gives light and ventilation. In the winter time it will serve the purpose of a public hall. It is intended to spend a further sum of 7,300*l*. in reconstructing and remodelling the older buildings, where there will be a boys' swimming bath in the summer and a gymnasium in the winter.

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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.



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VARIETIES.

The Lincoln City Council propose to erect a public elementary school for about 900 children in Mount Street.

The Great Western Railway Company are about to provide a new goods station in Moor Street, Birmingham.

The County Council of Berkshire propose to provide a new public elementary school for about 220 children in the parish of Thatcham.

The national school at Edale, Derbyshire, is to be enlarged to meet the requirements of the Board of Education. Messrs. Carrey & Thompson, Derby, are the architects.

West Hartlepool Town Council on Tuesday decided to build a new secondary school for girls, at a total cost of about 12,000*l.*

Proposals are being considered by the Holborn Borough Council for a big building scheme on the site of the Italian colony. The consent of the Council is being sought for the closure of the courts.

The Butter Cross at Ludlow is to be converted into a fire station. A loan of 500*l.* has been approved by the Local Government Board for this work and the purchase of a steam fire-engine.

The County Borough Council of Liverpool propose to enlarge the Rice Lane Council public elementary school, Walton, by providing additional accommodation for about 500 children.

New law courts are to be erected at Bournemouth jointly by the Corporation and the Board of Works at a cost of over 20,000*l.* The Board of Works will contribute 6,000*l.* towards the expenditure.

The Glasgow City Improvements Committee recommend acceptance of the offer by Messrs. John Train & Taylor, amounting to 23,086*l.* 13*s.* 9*d.*, for the erection of the buildings at the corner of Bell Street and High Street on the site ot Lady Barrachney's land.

Hartlepool Town Council have decided that as there had been no applications to take up leases of land belonging to them in Northgate, Corporation Road and Warren Street, they would themselves build workmen's dwellings thereon. It is estimated that the amount required to carry out the scheme will be 4,000*l.*

The Durham Education Committee report that in connection with colliery developments in the Sixth Pit (Fence Houses) district, about 500 houses are to be built. They therefore recommend that a new school be provided for about 900 scholars, at an estimated cost of 11,875*l.*

The Imperial Trade Correspondent at Toronto has forwarded to the Board of Trade a copy of the report of a committee appointed to consider the advisability of preparing and carrying out a comprehensive plan for beautifying the city of Toronto. This report may be seen by British firms at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

The sand pits opened some time ago on the Grange Hill estate, to the west of Kinghorn, were last week taken over by Messrs. Easton, Gibb & Co., the material to be used in the construction of the naval base at Rosyth. A quantity of 500,000 tons is likely to be removed, with a daily output of 200 tons. It is understood that Messrs. Easton, Gibb & Co. are negotiating for a supply of water to manufacture brick on the spot.

The Willesden Paper and Canvas Works, Ltd., announce the declaration and payment of dividends at the rate of 15 per cent. on the Ordinary shares, and 10 per cent. on the Deferred shares for the year ending June 30.

The French *Journal Officiel* of July 26 contains a decree authorising the raising of a loan of 1,200,000*l.* for public works in the French West African Colonies in 1910 and 1911. The works chiefly consist of railway extensions. The *Journal*, containing further particulars, may be seen by British firms at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

An application has been received by the Board of Trade from the Captive Aeroplanes, Ltd., for permission to erect on the foreshore of the River Humber, on a site about 100 feet north of the switchback railway, at Cleethorpes, an "Aeroplane Flight" or "Captive Aeroplane," consisting of an open timber structure, about 200 feet long, 145 feet wide and 42 feet in height.

The memorial stone of the new parish church at Grangemouth, N.B., was laid on Saturday with Masonic honours. The church is situated in Ronaldshay Crescent, a residential part of the town, and will accommodate 800 worshippers, and hall 400 persons, the total cost being between 7,000*l.* and 8,000*l.* The design is Perpendicular Gothic. The architects are Messrs. Wilson & Tait, Grangemouth.

The Admiralty scheme for the manufacture of torpedoes on the Clyde which led to the erection of the now almost completed factory at Battery Park, Greenock, is being considerably amplified, and it has been practically decided to add to the works. Plans have been prepared, and the total cost of the extension is expected to be about 25,000*l.* A considerable number of cottages for the operatives are in course of erection.

The Royal assent was given last week to a provisional order to enable Rhyl Pier to be extended some 600 yards seawards by a ferro-concrete jetty, together with other extensive works which were described in our issue of April 1. The company who are promoting the scheme will have a capital of 70,000*l.* The work is to be commenced very shortly. The architects are Messrs. Maxwell & Tuke, 25 Brazennose Street, Manchester.

The Local Government Board have sent an ultimatum to the Town Council of Berwick informing them that unless they receive satisfactory proposals within a month for dealing with the water supply of the borough an inquiry will be held, with a view to the employment of compulsory powers. The chief deficiency is in connection with the supply for Tweedmouth and Spittal. A scheme estimated to cost about 20,000*l.* was passed seven years ago, but was ultimately rejected.

The Birkenhead Town Council on the 3rd inst. adopted the Alwen water scheme for the future supply of the town. The first work to be carried out will be the clearing of peat from the proposed Alwen reservoir and the construction of a dam 458 feet long, 92½ feet high, and with a capacity of 3,500 million gallons. It has been decided that the work will not be carried out by direct employment of labour, but by contract. The scheme, which will take about five years to carry through, has been prepared by Sir Alexander Binnie & Son.

The Sanitary Committee of the Doncaster Corporation recommend the formulation of a scheme for the erection of 144 houses for the working classes off the new North Bridge Road. This land was acquired in the carrying out of the Marshgate Bridge scheme, and no provision has been made for the working classes dispossessed, except by the erection of a number of wooden huts in another quarter of the town. The Council have now decided to offer the land off North Bridge Road to speculative builders to supply the need for cottage houses, but none of the land has been taken. It is understood that the action of the Sanitary Committee is due to pressure brought to bear upon the Corporation by the Local Government Board.

The statue of Dr. Samuel Johnson erected at the east end of St. Clement Danes in the Strand, where he used to attend, was unveiled on the 4th inst. The life-size figure is in bronze, and it stands on a granite pedestal. The burly doctor appears to be making one of his weighty utterances; in his left hand he holds a book and his right is raised to reinforce the point of the argument with a vigorous gesture. The statue has a splendid background in the apse of the church. It is the work and gift of Mr. Percy Fitzgerald, M.A., who has edited Boswell's "Life of Johnson," and who has also executed a bronze statue of Boswell at Lichfield. Among other works in sculpture by Mr. Fitzgerald are busts of Dickens and Carlyle, and a pulpit for Palace Street Church, S.W.

THE DISINFECTION OF SCHOOLS IN RELATION TO PUBLIC HEALTH.*

The enormous annual expenditure by local authorities for the upkeep and maintenance of hospitals for the isolation and treatment of infectious cases has prompted me to bring before the Conference a question of supreme importance to all sanitary authorities, and indeed to the nation at large.

Sanitary science has done much and is still making great strides in eradicating disease, but too often our energies are directed, are they not, to the curative rather than the preventive phase of the ideal? Take the isolation hospitals to-day and inquire the ages of the patients, and you will find that in overwhelming numbers the children of school age predominate.

* A paper read by Mr. J. Arthur Cowley, Clerk to the Northwich Urban District Council, at the annual conference of the Urban District Councils Association at Ilfracombe.

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I venture to suggest that the two principal reasons for this result are the susceptibility of children to the ordinary type of infectious disease and the bringing together of the little folk where daily contact is unavoidable. The first is a decree of Nature, and as such may be irresistible; the second is an essential part of our national life, and on the grounds of expediency is unassailable. If such be the case, it is vitally important in the interests of public health that both factors should receive the attention of those authorities who have been called into being primarily to guard the public health. The first is interwoven with the home life of the child; the second is connected with school life, and it is that with which I wish to deal briefly.

It cannot be denied that the schools of our country provide an easy and rapid means of spreading infectious disease, the classrooms being exceptionally favourable centres for its dissemination. The compulsory attendance of children at school, and the visit of the school attendance officer in case of default, has its value, no doubt; but there is no gainsaying the fact that children are often sent to school by affrighted parents while the infectious disease is in process of development or incubation, and there is much to be said for the plea that, concurrent with the system of compulsory attendance, preventive means should be adopted for safeguarding the health of the rising generation. The more general infectious diseases which affect school attendance are whooping cough, scarlet fever, measles, mumps and diphtheria, and it has been clearly proved that the use of disinfectants is of the utmost value in destroying the germ life.

During my reading and study of the subject I have been struck with opinions expressed by medical officers of health, and there appears to be a consensus of opinion in support of the statement I have just made that schools are the chief agencies for the dissemination of infectious disease, and that the principal method of propagating infection is the attendance of "early stagers" at school. It is also submitted that a periodical disinfection of schools is essential, even where no infection has been found to exist.

In the past the systematic disinfection of schools has been a neglected part of our hygienic education, and it is notorious that the only serious disinfection which has taken place in some schools has been after or during closure under the advice of the medical officer of health in consequence of an outbreak of disease. This is all very well, but the evil has then been wrought, and the infection has been very probably carried to the home. Dr. Henry Davy, when president of the British Medical Association, said that "the only way to actually prevent infectious disease was by a perfect system of school hygiene, physical and mental, and by a careful system of disinfection and sanitation." The germs lurk about our schools, and the dust on the floors, window sills, picture rails and pictures forms a favourable resting place for danger unthought of. The Scottish Education Department, impressed with the importance of healthy schools, has issued an admirably written pamphlet on the cleansing and disinfection of schools, and the whole case is tersely put in one sentence, which says:—"To cleanse a schoolroom properly it is necessary to destroy the germ life as well as to remove the visible dust." I cannot discover that the Education Department of this country has been equally alive to the importance of securing a regular and systematic disinfection of school premises. Indeed, quite recently the Minister for Education stated in answering a question in the House that the Board of Education had not hitherto put forward any specific recommendations as to methods of cleansing and disinfecting of schools, but he promised to consult with the President of the Local Government Board to see if they could act together with a view to the issue to the local authorities in England of recommendations similar to those contained in the Scotch memorandum. The Local Government Board have certainly laid down rules in the memorandum of 1909 on closure and exclusion from schools as to the action to be taken in respect of infectious diseases occurring among school children, but it is evident that the directions apply when infectious disease is known to exist. In clause 21 of the memorandum it is stated that "disinfection of special classrooms or of particular articles should be undertaken when there is reason to believe that these have been infected." There is some satisfaction to be gained from a knowledge of the fact that the question of systematic disinfection is receiving consideration.

While the great State Departments charged with the protection of public health and the ramifications of education are considering the matter, it is gratifying to know that the movement has already been taken up in a practical form by many of the local education authorities, and that the results attained are really surprising. At some of the public schools—notably Eton, Winchester and Rugby—the system is at work, and regular disinfection is carried out.

I know I am treading delicate ground in advocating a system which must of necessity entail an expenditure and become a charge on the local rates; but dealing with the question primarily as a matter of public health, I submit that the effort is worth the making, and the expenditure involved in the accomplishment will be amply justified.

The isolation of the infected sick in this country has not achieved results commensurate with the enormous sums expended in the establishment and maintenance of isolation hospitals, and it is a moot point whether the operation of the Education Acts has not been a material factor in increasing the responsibilities of local authorities in hospital provision and maintenance. If the effect of establishing a complete system of disinfection in every school has the effect (as I believe it will have) of reducing the number of cases of infectious disease, and, as a consequence, the heavy cost of isolation is materially lessened, this will more than counterbalance the charge on the rates to meet the cost of disinfection.

I have had brought to my notice admirably drawn regulations adopted by education committees relating to school cleaning and disinfection, but I have satisfied myself on inquiry that in practice these regulations are a dead letter. They are placed in the hands of school cleaners who have not the time at their disposal to put them into effect, and suggestions are made as to the use of disinfectants, but none are supplied. In cases where the local authority is the education authority for the district it is possible to obtain an understanding between the health and education committees as to systematic disinfection and periodical visits to the schools by the health officials, but there is a difficulty in making such arrangement in all circumstances, or where the control of education is not in the hands of the local sanitary authority.

In my own district, which has not the distinction of being an autonomous area, the council endeavoured to get the education committee to carry out an improved and extended system of disinfection, but failed, and subsequently offered to thoroughly disinfect the schools during closure for holidays, free of cost to the committee. The offer was accepted, and since the inception of the system there has been a marked decrease in the number of infectious cases in the district. It is an essential part of the duty of an education authority to keep the school buildings in a clean and sanitary condition, and it is clear from recent decisions that their responsibilities extend to the elimination of any possibilities of danger to the teachers and scholars.

It may seem a far-fetched idea to extend the application of these decisions to the contraction in a school of an infectious disease, but it must not be forgotten that under section 120 of the Public Health Act, 1875, or section 5 of the Infectious Diseases Prevention Act, 1890, a local authority may require the disinfection of a "house" to be undertaken, and in default may themselves carry out the work and recover the cost from the owner or occupier. For the purposes of both sections the definition of "house" includes a school.

It is no part of my purpose now to suggest any definite scheme of disinfection, but there should be a graduated form in operation on lines carefully laid down, commencing with the daily sweeping of the floors after being thoroughly damped with water containing a specified quantity of disinfecting fluid. Dry sweeping of school floors cannot be too strongly condemned. The primary stage should extend by weekly and monthly advances of more thorough work until the stage is reached of complete and general overhauling of floors, walls, fixtures, fittings and equipment during the holidays. The apportionment of the cost as between ordinary cleaning and disinfection should present no insuperable difficulty. Indeed, the plan I have outlined need entail little more cost than what ought to be regarded as ordinary school cleaning, and a small contribution from the health authority should meet the case. At any rate an adjustment should be very simple, and if the school and health authorities are actuated by a common aim the result must be beneficial.

I *move*:—

"That in the interests of public health it is desirable, in the opinion of this Conference of Urban District Councils of England and Wales, that a regular system of disinfection should be established in every school."

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THE

Architect and Contract Reporter.

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The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

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Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

Antwerp.—Oct. 1.—An international competition is being arranged for a scheme for the laying out of the land surrounding Antwerp, which will shortly be available by the demolition of the encircling fortifications. Premiums of 1,000*l.*, 400*l.*, and 200*l.* are offered. Copies of the conditions, &c., may be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C., or, on payment of 100 francs from the "Commission d'études de l'aménagement de l'agglomération anversoise," 57 Rue du Jardin des Arbalétriers, Antwerp.

Belfast.—Sept. 15.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of *bona-fide* design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

Egypt.—Aug. 24.—The Egyptian State Railways Administration propose to hold a limited competition for a new railway passenger station at Alexandria. Architects desirous of taking part in the competition should make application to the Director-General of the Egyptian State Railways, Cairo, not later than noon on August 24, giving information as to their status as architects and a list of the constructions for which they have prepared plans during the last three years. Six architects will be finally permitted to compete. Prizes of 400*l.*E, 200*l.*E, and (two of) 100*l.*E will be awarded for the best plans.

Folkestone.—Sept. 10.—Designs are invited for a secondary school to accommodate 150 boys. Deposit 2*l.* 2*s.* Mr. A. F. Kidson, town clerk, Folkestone.

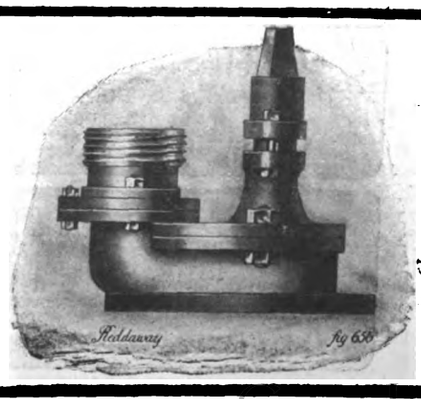
Gorleston-on-Sea.—August 31.—The Governors of the East Anglian Institution for Blind and Deaf Children invite plans and designs for a new building to be erected at Gorleston-on-Sea. The competition will be confined to architects having an office or residing in the areas of the following education authorities:—Cambridgeshire, Isle of Ely, Lowestoft, Norfolk, Norwich, East Suffolk, and Great Yarmouth. Copies of the instructions to architects within the prescribed areas will be sent on a remittance for 10*s.* (returnable). Documents to be sent back. Mr. D. O. Holme, clerk of the governors, Castle Chambers, Norwich.



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IRELAND.—August 23.—The Meath County Council invite architects practising in Ireland to submit plans and specifications for county offices to be erected at Navan. Apply to the Secretary, Meath County Council, Navan.

IRELAND.—Sept. 1.—The Kingstown Urban Council offer prizes of 50*l.* and 20*l.* for the best sets of plans for a Carnegie Library to be erected in Lower George's Street. Deposit 1*l.* 1*s.* Mr. J. Sherlock Vaughan, town clerk, Town Hall, Kingstown.

MANCHESTER.—The Corporation invite plans, specifications and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

RUISLIP.—The Directors of Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

SHERINGHAM.—Sept. 5.—The Urban District Council invite designs for proposed new Council offices. Apply, enclosing a stamped and addressed envelope, to Mr. Edgar C. Rolfe, clerk, Church Street Chambers, Sheringham, Norfolk.

WALES.—Sept. 19.—The town hall committee invite competitive designs, &c., for the proposed alterations and additions (not exceeding in cost 3,000*l.*) to the town hall and market hall, Maesteg. Conditions, with a plan of site and sections at ground level, may be obtained from Mr. Samuel J. Harpur, engineer and surveyor, Town Hall, Maesteg. Two premiums are offered, namely, 25 guineas and 10 guineas, as first and second respectively. The committee do not bind themselves to award the premiums, and they do not intend to engage the authors of the designs for which premiums may be awarded to carry out or supervise the work.

WALES.—Oct. 1.—The Town Council of the borough of Denbigh invite competitive plans and designs of a public hall, markets, municipal buildings, &c., which it is proposed to erect at a cost not to exceed 10,000*l.* Three premiums are offered, viz. 75*l.*, 30*l.* and 20*l.*, as first, second and third respectively. Send 1*l.* 1*s.* deposit for particulars, &c., Mr. J. Parry Jones, town clerk, Denbigh.

CONTRACTS OPEN.

BANBURY.—Aug. 31.—For erection of business premises at Middleton Cheney, for the committee of the Banbury Co-operative Industrial Society, Ltd. Mr. Frederick J. Cooke, architect and surveyor, 33 Bridge Street, Banbury.

BEDFORD.—Aug. 26.—For erection of a county highways depôt. Deposit 2*l.* 2*s.* Mr. W. H. Leete, architect, Shire Hall, Bedford.

BELFAST.—Aug. 23.—For carrying out the following works, for the Guardians:—(1) Heating (male block, convalescent department); (2) increasing height of chimney at laundry; (3) lavatory, &c., accommodation (male infirm department); (4) ward kitchens (infirmary); (5 and 7) coal shed (laundry), raising roofs, and repairs kitchen (convalescent department); (6 and 8) putting in new skylights (convalescent department) and making cubicles (nurses' home). Mr. Joseph W. Robb, clerk, Workhouse, Belfast.

BRAMLEY.—Aug. 24.—For erection of new working men's club premises in Elder Road, Bramley, Leeds. Send names by Aug. 24 to Mr. Wm. Shackleton, architect, Manor House Street, Pudsey.

BURNLEY.—Aug. 24.—For the erection of a new elementary school, to accommodate 300, at Hapton, near Burnley, for the Lancashire education committee. Deposit 2*l.*, returnable. Mr. Henry Littler, architect, 16 Ribblesdale Place, Preston.

BURY.—Sept. 6.—For the enlargement of the Bury (Lancs.) Post Office. Deposit 1*l.* 1*s.* The Postmaster, Bury Post Office; or H.M. Office of Works, Storey's Gate, London, S.W.

CATCHGATE.—Aug. 22.—For the several works required in erection of stable and coachhouse, &c., at Catchgate, Durham. Mr. Thomas E. Taylor, architect and surveyor, Front Street, Annfield Plain, or the Grove, Lanchester.

CHURCH CROOKHAM.—Aug. 23.—For the erection of infant school at Church Crookham, Hants. Mr. Alfred H. Guyer, architect, Farnham, Surrey.

CLECKHEATON.—Aug. 25.—For the various works required in erection of new shed and office at Woodside Works. Mr. William Morton, architect and surveyor, opposite Central Chapel, Cleckheaton.

DODWORTH.—Aug. 25.—For the erection of a school, chapel and boundary walls in Keresforth Road, Dodworth, Barnsley. Messrs. Crawshaw & Wilkinson, architects, 13 Regent Street, Barnsley.

DODWORTH.—Aug. 27.—For the construction of a cemetery, including the laying out of the ground and the erection of all buildings. Mr. E. W. Dyson, architect, 10 Regent Street, Barnsley.

DUBLIN.—Sept. 1.—For erecting a nursing home in connection with St. Vincent's Hospital, Stephen's Green, Dublin. Deposit 3*l.* 3*s.* Messrs. W. H. Byrne & Son, architects, 20 Suffolk Street, Dublin.

FELIXSTOWE.—Aug. 26.—For erection of an isolation hospital, with administrative, disinfecting, and laundry blocks. Deposit 2*l.* 2*s.* Mr. H. Clegg, A.M.I.C.E., Town Hall, Felixstowe.

FLUSHDYKE.—Aug. 20.—For the various trades in connection with erection of the Flushdyke new Council school, Ossett. Send 1*l.* deposit by Aug. 20, to the Secretary, Education Department, Town Hall, Ossett.

GLOUCESTER.—Sept. 10.—For proposed additions to Sir Thomas Rich's school. Send names by Aug. 20 to Mr. Walter B. Wood, architect, 12 Queen Street, Gloucester.

GRIMSBY.—Aug. 23.—For the erection of a new pavilion at the Bowling Green, Brighowgate. Mr. Herbert C. Scaping, architect, Court Chambers, Grimsby.

HALIFAX.—Aug. 24.—For the execution of the following works required in the erection of isolation wards and cookery kitchen at Stoney Royd Hospital, viz.:—(1) mason, excavator, and bricklayer; (2) carpenter and joiner; (3) plumber and glazier; (4) slater and plasterer; (5) concretor; (6) steelwork; and (7) painter work. Deposits as follows:—10*l.* for No. 1, 5*l.* each Nos. 2, 3, 4, 5, 6, and 7. Mr. James Lord, M.I.C.E., borough engineer, Halifax.

HALIFAX.—Aug. 25.—For the various trades in alterations to premises for branch bank, at the junction of Town Hall Street and Hollins Mill Lane, Sowerby Bridge, for the Halifax Commercial Banking Company, Ltd. Mr. Thos. Kershaw, A.R.I.B.A., architect, Lancs. and Yorks. Bank Chambers, Halifax.

HANDSWORTH.—Sept. 9.—For the following works, viz.:—Handsworth: Woodhouse Council school, alterations to cloak room (builder, joiner and plumber), for the West Riding education committee. The Education Architect, County Hall, Wakefield.

HARROGATE.—For proposed leather goods factory, Grove Park Terrace. Send names to Mr. John Houfe, architect, Albert Chambers, Albert Street, Harrogate.

HULL.—For erection of fish-curing premises, stores, &c., Goodwin Street. Send names and addresses to Messrs. Freeman, Son & Gaskell, architects and surveyors, Albert Chambers, 11 Carr Lane, Hull.

KEIGHLEY.—For the work required in erection of a detached house and a pair of semidetached cottages at Whins Wood. Messrs. Moore & Crabtree, architects, &c., York Chambers, Keighley.

KEIGHLEY.—Aug. 23.—For pointing Worth Wesleyan Chapel; for painter and decorator work required in renovations. Mr. Hartley Hogarth, architect, 43 Redcliffe Street, Keighley.

KNYPERSLEY.—Aug. 23.—For erection and completion of a Council school for 350 children and a handicraft centre, at Knypersley, in the parish of Biddulph, Staffordshire. Deposit 1*l.* 1*s.* Mr. Graham Balfour, director of education, County Education Offices, Stafford.

LEEDS.—Aug. 31.—For alterations and furnishing (carpenters and joiners) to the offices of the City Treasurer's and City Engineer's Departments, Municipal Buildings. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

LONDON.—Aug. 24.—For the reconstruction of roofs to the Jones's gallery and galleries 90 and 91 at the Victoria and Albert Museum (old building). Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

LONDON.—Aug. 31.—For the erection of a discharge block and staff quarters at the Eastern Fever Hospital, Homerton Grove, Homerton, N.E. Deposit 1*l.* 1*s.* Mr. W. T. Hatch, M.Inst.C.E., M.I.Mech.E., engineer-in-chief, Metropolitan Asylums, Office of the Board, Embankment, E.C.

LOWESTOFT.—For erection of the new Territorial drill hall, Beccles Road. Apply to Mr. F. W. Richards, M.S.A., architect, 14 Stanley Street, Lowestoft.

MACCLESFIELD.—Aug. 23.—For erection and completion of a public elementary school building, play sheds, boundary fences and other works in connection therewith, on land in

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Byron Street. Messrs. Whittaker & Bradburn, architects, 19 King Edward Street, Macclesfield. Send 2*l.* 2*s.* deposit to Mr. Arthur T. Pattinson, clerk to the Education Committee, District Bank Buildings, Macclesfield.

Manchester.—Sept. 10.—For the erection of the Elysian Street Municipal school, Openshaw, and the Ravensbury Street Municipal school, Clayton. Deposit 2*l.* 2*s.* at the Education Offices, Deansgate, Manchester.

Morecambe.—Sept. 5.—For erection of a new art and technical school. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Nantwich.—Aug. 23.—For erection of seven single dwelling-houses and six sets of farm buildings on the Batherton Estate, near Nantwich, Cheshire. Deposit 1*l.* The County Estate Office, 49 Northgate Street, Chester.

Newcastle-under-Lyme.—Aug. 24.—For erection of a post office. The Postmaster, Newcastle-under-Lyme, or H.M. Office of Works, Storey's Gate, London, S.W.

Old Hartley.—Sept. 3.—For erecting new out offices, constructing a drainage system, &c., at Old Hartley Council school, Northumberland. Deposit 1*l.* 1*s.* Mr. C. Williams, secretary to the education committee, the Moothall, Newcastle-on-Tyne.

North Shields.—Sept. 6.—For alterations to and constructing conveniences upon the premises, 15 and 16 Borough Road. Deposit 1*l.* 1*s.* Mr. John F. Smillie, borough surveyor, Tynemouth.

Poole.—Aug. 29.—For erection of an elementary school at South Road, for 580 children. Deposit 5*l.* Mr. Samuel J. Newman, F.R.I.B.A., borough surveyor, Municipal Buildings, Market Street, Poole.

Preston.—Sept. 3.—For erection of a grammar school for boys in Moor Park Avenue. Deposit 2*l.* 2*s.* The Education Offices, Lancaster Road, Preston.

Riseley.—Aug. 27.—For erection of a footbridge at Riseley, Swallowfield, Berks. The Surveyor to the Hartley Wintney R.D.C., Fleet, Hants., or the Surveyor to the Wokingham R.D.C., Toutley, Wokingham.

Rotherham.—Aug. 25.—For the whole of the work required in the erection and completion of six dwelling houses, stable, and warehouse in Fitzwilliam Road and Selwyn Street. Messrs. Edward Hutchinson & Son, architects and surveyors, 18 Howard Street, Rotherham.

Salford.—Aug. 27.—For erecting an infants' school in Robert Hall Street. Send 1*l.* 1*s.* deposit by Aug. 27 to Mr. J. B. Broadbent, A.R.I.B.A., 15 Cooper Street, Manchester.

Scotland.—Aug. 25.—For the following works in the erection of a lodging-house on main road between Torryburn and Culross, viz.—mason, joiner, plumber, slater, and plaster works. Messrs. Wm. & C. Scott Gullen, architects, 83 High Street, Cowdenbeath.

Scotland.—Aug. 25.—For carrying out additions and alterations to the Post Office, Johnstone, Renfrewshire. The Post Office, Johnstone, or H.M. Office of Works, 3 Parliament Square, Edinburgh.

Scotland.—Aug. 25.—For alterations and additions to Motherwell Post Office. Deposit 1*l.* 1*s.* The Post Office, Motherwell, or H.M. Office of Works, 3 Parliament Square, Edinburgh.

Scotland.—Sept. 1.—For the construction of a brick or wooden shed, 30 feet by 18 feet, at Shettleston, Lanark. The Shettleston police station, Lanark, N.B.

Skelmanthorpe.—Aug. 24.—For the erection of four dwelling houses on the Common. Mr. W. Morley, secretary of the Co-operative Society, Skelmanthorpe.

Skipton.—Aug. 25.—For the mason, joiner, plumber and glazier, painter, slater and ironfounder work required in erection of public abattoirs in the Dockyard. Deposit 1*l.* Mr. A. E. W. Aldridge, surveyor, Town Hall, Skipton, Yorks.

Stannington.—Aug. 23.—For additions to children's sanatorium, Stannington, Northumberland (Lady Stephenson wing). Deposit 1*l.* 1*s.* Mr. D. M. Spence, architect and surveyor, Shotley Bridge.

Stannington.—Aug. 23.—For the foundation works and erection of twelve cottages at Stannington, near Morpeth, for the Committee of Visitors of the Gateshead Asylum Deposit 5*l.* Messrs. J. P. Allen & Partners, surveyors, Grainger Street West, Newcastle-on-Tyne.

St. Helens.—Sept. 12.—For erection of a secondary school for boys in Cowley Hill Lane, St. Helens, Lancs. Deposit 1*l.* 1*s.* Mr. Frank S. Biram, architect, George Street, St. Helens.

Stockport.—Aug. 25.—For the manual and team labour and materials required in the erection of a retaining wall, pump-house, &c., at Millgate Works. Mr. John Atkinson, A.M.I.C.E., borough surveyor, Town Hall, Stockport.

Stone.—Aug. 23.—For erection and completion of combined cookery, laundry-work and handicraft centres, with class-rooms, &c., at Stone, Staffordshire. Send 1*l.* 1*s.* deposit to Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Wales.—For erection of shop premises in Howell Street, Cilfynydd, for the Ynysybwl Co-operative Society. Mr. P. J. Jones, architect, Church Street, Pontypridd.

Wales.—Aug. 20.—For the renovation of and additions to Bridge House, Llanmaes (1 mile from Llantwit Major, Glamorgan). The County Police Station, Llantwit Major, Glamorgan.

Wales.—Aug. 22.—For erection of twenty-four houses at Penpedairheol, Gelligaer, for the Rhosyfedw Building Club. Deposit 1*l.* 1*s.* Messrs. Johnson & Richards, architects, Merthyr Tydfil.

Wales.—Aug. 23.—For the erection of a drill hall and quarters for the 1st Welsh Field Ambulance, Ebbw Vale, Mon. Deposit 2*l.* 2*s.* Mr. H. Waters, M.S.A., architect, Ebbw Vale, Mon.

Wales.—Aug. 25.—For erection of nine houses at Caerphilly, for the Caerphilly Building Company. Mr. Sidney Williams, M.S.A., Wharton Street, Cardiff.

Wales.—Aug. 31.—For rebuilding the Lamb and Flag Inn, Bryncoch, Neath. Mr. Mansel H. Hunter, architect and surveyor, Neath.

Wales.—Oct. 1.—For building a school (accommodation 500) at Hendy, Pontardulais, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., County Architect, County Education Offices, Carmarthen.

Wanstead.—Sept. 1.—For about 500 yards of terrazzo paving, for the receiving homes in course of erection at Aldersbrook Road, Wanstead, N.E. Apply by Aug. 25. Mr. W. Jacques, A.R.I.B.A., 2 Fen Court, E.C.

Workington.—Aug. 23.—For the whole of the work required in the erection and completion of a technical and secondary school at Workington, Cumberland. Deposit 2*l.* 2*s.* Messrs. Clark & Moscrop, architects, Darlington.

Walthamstow.—Aug. 31.—For the supply, delivery, and erection of the steel work, &c., required in the construction of a store shed at the depôt, Exeter Road. Deposit 1*l.* 1*s.* Mr. E. Morley, surveyor to the Council, Town Hall, Walthamstow.

Walthamstow.—Aug. 31.—For the supply, delivery, and erection of the steel work, &c., required for the extension of the car depot, Chingford Road. Deposit 1*l.* 1*s.* Mr. G. W. Holmes, A.M.I.C.E., engineer to the Council, Town Hall Annexe, Walthamstow.

TENDERS.

BILLINGSHURST.

For the provision of a new infants' school at Billingshurst for the West Sussex education committee.

J. Wadey	£2,228	9	5
H. & E. Waters	1,820	0	0
Hillman & Murrell	1,749	0	0
Ockenden & Son	1,732	0	0
E. Wadey	1,675	0	0
Reeves & Port	1,660	0	0
Peskett & Co.	1,653	0	0
Lindfield & Son	1,650	0	0
Cook & Sons	1,631	0	0
Sandell & Sons	1,569	0	0
Rowland Bros.	1,549	0	0
W. Potter	1,540	0	0
G. Potter, Horsham (*accepted*)	1,449	0	0

For alterations and additions to Billingshurst Council school.

J. Wadey	£1,022	10	0
Hillman & Murrell	975	0	0
E. Wadey	945	0	0
Lindfield & Son	930	0	0
H. & E. Waters	889	0	0
Ockenden & Son	864	0	0
Reeves & Port	861	0	0
Peskett & Co.	853	0	0
Cook & Sons	819	0	0
Sandell & Sons	800	0	0
Rowland Bros.	795	0	0
G. Potter	739	0	0
W. Potter, Horsham (*accepted*)	650	0	0

DONCASTER.

For making a new road from the race stands to Sandall Beat.

Arnold & Son (*accepted*)	£1,197	15	0

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CHESTERFIELD.

For the erection of new offices for the Health Department and alterations and additions to the borough surveyor's offices, Saltergate. Mr. N. Smith, borough surveyor.

Wright	£761 0 0
Harris & Hunt	760 0 0
Wildgoose	754 13 3
Collis & Sons	739 0 0
Marsden Bros.	731 6 2
Kirk, Chesterfield (*accepted*)	708 0 0

CHINGFORD.

For making up, paving, kerbing, lighting, &c., Bateman Road and Royston Avenue. Mr. J. T. Griffin, surveyor.

Grounds & Newton	£1,829 0 0
Anderson	1,740 0 0
E. & E. Iles	1,677 0 0
Adams	1,551 11 6
W. & C. French	1,418 0 0
Greenfield	1,377 11 5
Gibbons, Leytonstone (*accepted*)	1,343 0 0

ERITH.

For the erection of the Erith Working Men's Club and Institute in Riverdale Road. No. 1 contract for ground floor. Mr. C. Wisher, architect, Erith.

Blay, Ltd.	£895 0 0
Thomas & Edge	835 0 0
Jarvis & Son	824 0 0
Archer & Son	793 0 0
Easton	760 0 0
Friday & Ling	720 0 0
Ware	717 0 0

FAREHAM.

For work in connection with the alterations to the kitchen, &c., at the Hants County Asylum.

Accepted tenders.

Hunt, Gosport, kitchen alterations	£2,925 0 0
Shalders & Davis, Southampton, engine and electric machinery	1,715 0 0
Morwood & Sons, cooking plant	980 0 0

FRITTENDEN.

For rebuilding the Saunder's Cross Bridge, Frittenden, Kent. Mr. Frederick W. Ruck, county architect, Maidstone.

Stanley & Sons	£448 0 0
Ellingham	443 0 0
Smith & Son	432 0 0
Davis & Leaney	429 0 0
Limebeer	419 12 0
Ellis Bros.	409 0 0
Barden & Head	408 0 0
Shippam	398 18 0
Wickens	395 10 0
Dixon	392 19 0
Wilkins	386 0 0
Howland, Ashford (*accepted*)	377 0 0

GEDLING (NOTTS.).

For the Church schools enlargement. Mr. R. Whitbread, M.S.A., A.R.S.I., architect, Carlton, Nottingham.

Cuthbert	1,042 10 0
Appleby	£1,128 8 0
Harper, Carlton, Notts. (*accepted*)	1,007 2 6

GUILDFORD.

For constructing sewage tank to hold 500,000 gallons, for the Town Council. Mr. C. G. Mason, A.M.Inst.C.E., borough engineer and surveyor, Tuns Gate.

Scheme "A."

May	£2,880 0 0
Franks	2,441 9 0

Scheme "B."

Holloway Bros.	3,250 0 0
Playfair & Toole	2,898 0 0
Yorkshire Hennebique	2,895 0 0
Hill	2,884 0 0
Tozer & Son	2,879 18 0
North	2,833 11 1
Garratt & Sons	2,796 0 0
Moss & Son	2,380 0 0
Streeter & Co., Shalford (*accepted*)	2,103 19 1

HAYDON BRIDGE.

For remodelling Haydon Bridge Shaftoe Trust School.

Charlton, Haydon Bridge (*accepted*)	£3,758 0 11

HATHERSAGE.

For new school, chapel and boundary walls, Hathersage, Sheffield. Mr. J. Miller, A.R.I.B.A., Sheffield.

Whole tenders.

Boot & Sons, Ltd.	£692 0 0
Page & Dalton	690 0 0
Dalton	684 17 0

Accepted separate tenders.

Bancroft & Son, Bradwell, mason	349 19 0
Tanfield & Son, Bradwell, joiner	134 0 0
Hall, Bradwell, plumber	93 0 0
Slack, Tideswell, slater and plasterer	59 0 0

LONDON.

For additions and alterations to 28 Portman Square, W. Mr. Fredk. W. Foster, architect, 26 Bedford Row, W.C.

Phillips & Sons	£6,489 0 0
Kirkby	6,468 0 0
G. H. & A. Bywaters	6,346 0 0
Minter	6,096 0 0
Foxley & Co. (*accepted*)	5,944 0 0

MAIDSTONE.

For the erection of new offices and workshops on Rogers's Wharf, St. Peter Street.

Burrows, Maidstone (*accepted*)	£2,064 0 0

NORTHWOOD.

For the construction of the sewer along Ducks Hill Road, for the Ruislip-Northwood Urban District Council.

Adams	£887 19 0
Free & Sons	838 13 0
Watson	764 12 0
Lee	752 16 0
Bate & Co.	747 6 0
Clements, Knowling & Co.	717 0 0
Langley & Johnson	695 6 6
Willis & Powis	662 0 0
Clark & Co., Edgware (*accepted*)	660 0 0
Surveyor's estimate	731 0 0

SCOTLAND.

For the construction of a storage and clear-water tank and line of pipes, for the Burgh of Montrose.

Wilson, jun., Cowdenbeath (*accepted*)	£9,421 0 0

SEDGEFORD.

For alterations and enlargement at Sedgeford Schools, Norfolk. Mr. H. J. Green, architect and diocesan surveyor, Norwich.

Youngs & Son	£1,919 0 0
Read & Wilbur	1,911 13 6
Cracknell	1,892 10 0
Dye & Allen	1,809 0 0
Hannant	1,763 0 0
Crisp	1,757 13 9
Southgate	1,726 9 9
Shanks, Chatteris (*accepted subject to modifications*)	1,594 0 0

WEYMOUTH.

For erection of an elementary school for 270 boys. Messrs. Crickmay & Sons, architects, Weymouth and Westminster.

Whettam, jun.	£4,363 0 0
Fursland	4,357 9 0
Lovatt	3,785 0 0
Conway	3,724 17 3
Trask & Son	3,591 10 0
Green	3,472 0 0
Bowman & Sons	3,469 8 0
Playfair & Toole	3,423 0 0
Wort & Way	3,336 8 1
Pittard & Son	3,280 0 0
Jenkins & Sons	3,259 0 0
Moore & Sons	3,159 15 0
Wakeham Bros.	3,072 0 0
Jesty & Baker	3,067 15 4

WOODBRIDGE.

For erection of cottage at Woodbridge, Suffolk. Mr. H. J. S. Abrams, surveyor, 8A Canfield Gardens, N.W.

Adams	£766 0 0
Smith	691 0 0
Bilby Bros.	648 16 6
Wash (*accepted*)	626 0 0

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BRUSSELS EXHIBITION.—BRITISH SECTION AFTER FIRE.

WALES.

For erection of branch premises, with house adjoining, at Victoria Village, Garndiffaith, for the Abersychan, British and Talywain Industrial Co-operative Society, Ltd. Mr. A. Gordon Babbidge, architect, Pontypool.

Powell Bros.	£1,025 10 0
Branch	945 0 0
Meara	915 0 0
Sainsbury, Pontypool (*accepted*)	800 0 0

In view of the growth of building in the Upper District of Renfrewshire (the total value of buildings for which plans have been passed in the six months ending June 30 was 117,578*l.*), and the increased demand on the Busby waterworks, the Eastwood and Mearns Water Committee of the County Council have had before them the question of introducing a further supply from the Benan Loch, in the parish of Eaglesham. Messrs. W. R. Copland & Sons, C.E., Glasgow, in a report on the subject estimate the cost to be 17,800*l.*

The Home Secretary has confirmed the by-laws made by the Lancashire County Council under the Advertisement Regulation Act, 1907. The operative clause in these by-laws runs:—"No advertisement shall in any of the districts hereinafter specified be exhibited on any piece of rock or cliff, or on any hoarding, board, stand, or other erection in any place visible from any highway, public footpath, or railway, so as to disfigure the natural beauty of any landscape." The districts to which the by-laws have been made to apply include the lake district of Lancashire, and it is hoped that the local authorities concerned will put these by-laws rigorously into operation.

THE EFFICIENCY OF THE BERKEFELD FILTERS.

It is an elementary scientific fact that absolutely pure water is not to be found in nature, since water always finds something to dissolve. Fortunately, filtration has reached such a stage that by it water which is not potable in its crude state may be rendered actually superior to a supply deemed sufficiently good not to require any treatment. Of filters there are many kinds, but many of them must be regarded with suspicion, even though at the time of purchase they only transmit perfectly transparent water. A most essential feature of a good filter, and it is one too frequently overlooked, is that it should allow of easy cleansing. This factor is emphasised strongly by Dr. Andrew Wilson, F.R.S.E., in a report on some very exhaustive experiments he recently conducted into the efficacy of the ubiquitous "Berkefeld" filter. The tests were made obviously under conditions of far more rigorous and severe kind than are met with in ordinary life and in the ordinary use of the filters. Nevertheless he concludes with the following emphatic statement:—

"The results of the investigations enable me to substantiate and confirm the previous reports made by experts regarding the efficacy of the Berkefeld filters. If science has spoken boldly and convincingly regarding any phase of importance in the matter of health, such utterance will certainly be found in the declarations, first, that ordinary filters are of no service whatever because they cannot yield what is wanted, a germ-free water; and, second, that in the Berkefeld filters are to be found appliances which can with all confidence be employed in securing a supply of absolutely pure drinking fluid."

He found that under all ordinary conditions these filters will yield a supply of sterile or germ-free water for at least fourteen days, at the end of which time the cylinder should

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BRUSSELS EXHIBITION.—FRENCH SECTION AFTER FIRE.

be sterilised by boiling. This he describes as "more than satisfactory." His report makes special reference to the experiments with typhoid fever microbes, which were introduced in quantities immeasurably greater than could occur in any ordinary supply. The importance of the splendid results here obtained lies in the fact that this organism is one likely to occur in contaminated water. Another rigorous test was with a very minute microbe which would find its way through any but the most efficient filters.

VARIETIES.

A new church is to be provided for the parish of Sulhamstead Bannister, Berkshire, as a memorial of the long connection of the Thoyts family with the district.

The Local Government Board have approved of the 45,000*l.* sewerage scheme for the whole of the Matlock district.

The Bournemouth Board of Guardians contemplate extending their infirmary ward accommodation at the workhouse, the plans involving expenditure of about 16,000*l.*

Tenders are being invited for the construction of new quays and breakwaters in the harbour of Almeria. The cost of the work will be about 51,250*l.*

The Court House Commissioners have received sanction at the Dean of Guild Court for the reconstruction of justiciary buildings at Jail Square, Glasgow.

The Lichfield City Council invite applications from fully-qualified persons who are willing to give instruction in building construction and drawing to the higher education evening classes.

Mr. W. A. Clegg, deputy borough surveyor of Bexhill, has been appointed surveyor and inspector of nuisances to the Dorking Urban District at a salary of 200*l.* a year, in succession to the late Mr. G. Somers Mathews.

There has just been added to the rapidly developing township of Kinlochleven, N.B., forty-eight dwelling-houses, a boarding establishment, and an administration building capable of accommodating 120 boarders. The buildings are constructed of reinforced concrete. The hollow walls are formed of slabs 1½ inch thick, built in between columns raised at intervals of about 7 feet.

The threatened strike in the building trade at Burnley, Nelson, Colne, and Padiham has been averted. The joiners and carpenters have accepted an advance forthwith of a farthing an hour in wages, with the promise of another farthing advance in January next.

The borough surveyor at Doncaster has been instructed to formulate a scheme for the erection in Marshgate of about 144 workmen's houses. The site is the surplus land after the completion of Marshgate Bridge.

The Harrogate Town Council have resolved to apply to the Local Government Board for sanction to borrow 20,000*l.* in connection with the completion of the waterworks at Roundhill, Masham. The Board will be asked to sanction a period of sixty years for the repayment of the loan.

Messrs. Prothero, Phillot & Barnard, architects, Cheltenham, have prepared a report on the condition of Mold Church, in consequence of which the work of restoration will be commenced as soon as possible. Subscriptions amounting to nearly 2,000*l.* have already been raised.

The old suspension bridge on Reigate Hill, Surrey, a well-known landmark to coaching men and motorists travelling to and from Brighton, which had been condemned as being unsafe several years ago, is to be removed. The Surrey County Council are about to erect in its place a ferro-concrete bridge, similar to one erected over Alum Chine, Bournemouth.

The Hampshire County Council have approved of an arrangement with the county boroughs of Bournemouth and Southampton for the building of a second asylum for the county at Park Prewett Farm, Basingstoke, the present one being inadequate for the demands made upon it. The accommodation thus provided will be for 1,300 patients.

The Streets Committee of the Bolton Corporation last week passed plans for a woollen spinning mill for M. A. Lepoutre, who at the present time has over 1,000 hands in the woollen industry in France. The new mill, which will be 100 feet long and 96 feet wide, will be bounded by Bridgeman Street, Barbara Street, and Caroline Street.

Messrs. W. Pattinson & Son, of Ruskington, have, it is stated, secured the Government contract to build the administrative block and the surrounding walls, 8 feet high, of the new Criminal Lunatic Asylum at Rampton, near Retford. The work has to be completed in eighteen months, and the contract amounts to about 80,000*l.*

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A committee of Trades and Friendly Societies at Doncaster have purchased from the Town Council land fronting North Bridge Road, containing about 810 square yards, at 2*l.* per yard, for a trades and labour institute. The scheme will involve between 6,000*l.* and 7,000*l.*

At a largely attended meeting last week of the clergy and vestries of the various Episcopal churches in Aberdeen and suburbs the proposal to establish a cathedral church in the city was unanimously adopted. The idea is to extend St. John's Church, and by acquiring some property secure a handsome entrance from Crown Street. To carry out the scheme in an adequate manner the cost, it is stated, will be about 30,000*l.*

Mr. John Thomas Christopher, F.R.I.B.A., Kensington, W., who retired from practice eight years ago, died last week in his eighty-first year. Mr. Christopher was connected with the Salters' Company since 1847, when he was apprenticed to the late Mr. Robert Garland, citizen and Salter, who was then the surveyor to the company. He was admitted on to the Livery in 1854, and on to the Court in 1885. Mr. Christopher served the office of Master in 1889, and the offices of Second and Upper Warden in 1887 and 1905 and 1888 and 1906 respectively.

The foundation-stone of a new Roman Catholic church to be erected in Church Road, Gosforth, was laid on Sunday last by the Bishop of Hexham and Newcastle. It will be a stone building of a striking Gothic design and cruciform in shape. Its length will be 85 feet, the height 50 feet, the width of transept 62 feet, and the height of towers 80 feet. It will have accommodation for 510 people, and the estimated cost is over 4,000*l.* The architect is Mr. C. J. Menart, of Glasgow, and the contractor Mr. W. C. Fleck, of Gosforth.

The County Council of Middlesex have decided to alter and extend the Guildhall, Westminster, which stands opposite the Abbey, at an estimated cost of 68,000*l.* For the enlargement the County Council have secured from the Crown the site of the old premises of the National Society in the Sanctuary, extending towards Great George Street. The materials for the new building are to be Portland stone and red brick. The special committee have been authorised to invite not less than twelve contractors to submit tenders for the work. The plans have been prepared by Mr. James S. Gibson, F.R.I.B.A., in conjunction with the county engineer.

At the last meeting of the Durham City Council the city accountant reported in connection with the city sewage scheme that the Local Government Board had sanctioned loans amounting to 43,508*l.*, and the amount actually borrowed was 40,508*l.* Of this 39,650*l.* has been spent and 3,857*l.* is still left. It is expected that 3,710*l.* will be required to complete the scheme. No further loan was recommended. The engineers are Messrs. Taylor, Wallin & Taylor.

The death is announced of Mr. James Potts, of the firm of William Potts & Sons, Ltd., clock makers, Leeds. Mr. Potts, who was in his sixty-third year, and lived at Holmleigh, Headingley, had been in failing health for a long time. His father, Wm. Potts, a Darlington clock maker, who migrated to Pudsey seventy-five years ago, and afterwards came to Leeds, was the founder of the firm. Mr. James Potts was connected with the business the whole of his life. The only member of the family now remaining with the firm is his brother, Mr. Robert Potts. Some years ago the firm were appointed clock-makers to the late Queen Victoria, and have carried out a very large amount of important work.

The Reformed Presbyterian Church, Nicholson Street, Glasgow, built in 1814, is being taken down, and in its place a more commodious edifice will be erected. The new building will have the following accommodation:—On ground floor: Hall, seated for 270 persons; lesser hall, seated for 80 persons; gentlemen and ladies' cloak-rooms, &c.; session-room, library, church, kitchen, and store-room. On first floor:—Church, seated for 400 persons; vestry, &c. The contractors for the work are:—Mason, Moses Barlas; joiner, Peter Cumming; plumber, John Paterson & Co.; slater, James Stewart, Sen., & Son; plasterer, Wemyss & Livingston; glazier, H. Smith & Co. The architects are Messrs. Miller & Black, F.R.I.B.A., I.A., Glasgow.

The British Embassy at Madrid report to the Commercial Intelligence Department of the Board of Trade that the Commission appointed by the Spanish Government to consider the expediency of holding an exhibition at that city have now decided in favour of a universal exhibition being held there in the year 1913. Tenders for carrying out this undertaking are invited from both Spaniards and foreigners, and must be presented to the organising committee before September 15. Tenders must be accompanied by a plan adapted to the selected site, a detailed description of the proposed buildings, gardens, &c., together with the necessary financial proposals. Deposits will be required, as well as evidence of financial capacity to fulfil the undertaking. The committee will announce their decision before October 30, and the work must be begun before January 1911 and completed by March 1913.

The Labour Department of the Board of Trade in their report on the labour market in July, say that in the building trade employment was moderate; rather better than a month ago, and much better than a year ago. The percentage of unemployed among the trade union carpenters and plumbers at the end of July was 6.4 as compared with 6.8 in June, and 10.4 per cent. a year ago. In the woodworking and furnishing trades employment continued moderate on the whole, and was better than a year ago. With coach builders it continued good, and with coopers it was fair. Trade unions, with a membership of 33,553, reported 4.5 per cent. of their members unemployed at the end of July as compared with 4.1 per cent. a month ago, and 7.1 per cent. a year ago. Employment in the brick trade during July, though still fair, on the whole showed some decline, as compared with a month ago; it was better than a year ago. The returns from firms employing 13,751 workpeople in the week ended July 23 showed a decrease of 3 per cent. in the amount of wages paid as compared with a month ago, and an increase of 1.7 per cent. as compared with a year ago.

The secretaries of the Board of Conciliation and Reference for the china and earthenware trades of the Potteries district have received the award of Mr. Ernest Moon, K.C., the independent chairman of the Board, with regard to the questions submitted to him as to wages on July 28. Six weeks before March 25 notices were given by both manufacturers and operatives in the sanitary trade, in accordance with rule, for a revision of prices. The manufacturers gave notice for a reduction of pressing prices, averaging approximately 15 per cent., and for the reduction of casting prices, also averaging 15 per cent. The operatives, on the other hand, gave notice for an increase of pressing prices of 15 per cent., and the abolition of stoppages to the amount of 25 per cent. altogether. The workers further gave notice for an increase of casting prices, averaging 30 per cent. The arbitrator's award is as follows:—Having considered the alteration in prices proposed by two notices given by manufacturers to their operatives and dated February 11, 1910, and by two notices of the same date which were given by operatives to their employers, in respect of which notices differences had arisen which were duly referred to me to determine, I have decided not to allow any of the proposed alterations in prices during the current trade year, and I hereby award accordingly.

The Rochester Bridge Wardens, subject to the consent of the Charity Commissioners, recently accepted the tender of Sir William Arrol & Co., Ltd.—75,317*l.* 6*s.* 6*d.*—for the reconstruction of Rochester Bridge, as reported in our issue of July 1. This amount was 11,000*l.* more than the lowest tender submitted by Messrs. Cochran & Son, and also several thousand pounds above the estimates of Joseph Westwood & Co., Ltd., and Andrew Handyside & Co., Ltd. Owing to this the Charity Commissioners referred the matter back to the Bridge Wardens for reconsideration. The question was again discussed by the Bridge Wardens at their last meeting. It was urged they could not go against the advice of their engineer, and a resolution was passed to adhere to their previous decision. It is expected that before giving their sanction the Charity Commissioners will themselves appoint an engineer to go into the matter.

The Naval, Mercantile Marine and General Engineering and Machinery Exhibition to be held at Olympia will be opened on September 1 by Lord Graham. Many of the latest inventions in all branches of engineering practice will be on view for the first time. The exhibits are to include metallurgical processes and raw materials, castings, lifts and lifting appliances, contractors' plant, grinding and crushing machinery, tubes and fittings, fire appliances, mechanical stokers and conveyors, warming, lighting, sanitary and ventilating apparatus, and gas, steam and oil engines. The exhibition will remain open until September 26. During the exhibition meetings of various engineering and scientific societies will be held at Olympia, including the following:—September 6, Junior Institution of Engineers; September 14, Institute of Metals; September 15, Institute of Sanitary Engineers; September 17, Institute of Marine Engineers; September 21, Society of Engineers; September 24, Association of Engineers-in-Charge.

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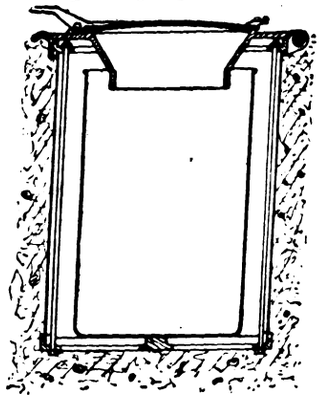
TRADE NOTES.

Messrs. McDowall, Steven & Co., Ltd., have issued loose sheets giving revised prices of baths and lavatory basins. Since their catalogue was compiled there have been fluctuations which in some cases enable them to offer more advantageous prices. To prevent these sheets being mislaid they are provided with a gummed edge so that the sheet of bath prices may be inserted before page 1001, and that of basins before page 1,099.

Consumers of gas in the district of the Gas Light and Coke Company will be glad to note that in the speech of the governor (Mr. Corbet Woodall) at the meeting of shareholders on the 5th inst. it was foreshadowed that there would be a further reduction in the price of gas at the end of this year, making the seventh reduction in eight years. This continuous decrease in the price charged by the Gas Light Company is very welcome alike to the consumers, who benefit to the extent of nearly 100,000*l.* a year by every reduction of 1*d.* per 1,000 cubic feet; to the shareholders, whose dividend can only rise as the price falls; and to the employees, whose share of the profits also varies inversely with the price of gas. The only people not pleased are the electricians, as every reduction in the price of gas further increases the already substantial difference in cost between electricity and gas.

The Llewellyn Williams chimney pot is one of those cures for smoky chimneys which are ornamental as well as useful. Lest it be inferred, however, that they sacrifice thereby anything of practical value it should be further explained that their claim to be ornamental is really a relative one, and may only be allowed by comparison with some of the monstrous smoke cures which disfigure the skyline. The Williams patent pot is above everything else a simple and unostentatious one. It is made of clay, and in two pieces. The flue proper has on its outer surface four perpendicular ridges ending at a horizontal ledge. On this ledge there rests a movable outer pot, with four curved openings at the base. By this means in all conditions of wind and in any position there is an updraught above the mouth of the flue. For the purpose of cleaning it is the same as an ordinary pot. There is nothing to get out of order, and no noise. Mr. Llewellyn Williams has met with a large amount of success with these pots, as also with his ventilators, and copies of testimonials can be seen at Woburn, Bucks., or 29 Wingate Road, Hammersmith.

C. H. Stephenson's patent underground garbage receiver is designed to supersede the unsightly and insanitary surface refuse bucket now generally in use. It consists of a wrought-iron circular case, which is placed in the ground to a depth of 27 inches; it has a cast-iron top with a hinged double lid, a special bucket is provided, which is inserted in the case. The upper lid is raised by a slight pressure of the foot, to receive



the garbage; when the foot is released the lid is automatically closed, and consequently there can be no smell, attraction for vermin, or the spreading of dangerous germs. When the bucket is full the lower lid is raised, the bucket lifted out, and when emptied again inserted in the case. This lower lid is so constructed that the bucket cannot be overfilled. When receiver is inserted in the ground it offers no obstruction to floor space. The electro represents section of receiver in the ground.

Mr. W. H. Lever, speaking on Tuesday at the annual dinner of the United Billposters' Association, held in London, suggested that they should introduce architectural designs on their hoardings, and he offered four prizes, to be competed for next year, of 50*l.*, 25*l.*, 15*l.*, and 10*l.* respectively, for the best bill-posting stations constructed from an architectural point of view.

THEORY AND PRACTICE IN ENGINEERING.*

When the question of appointing a surveyor or engineer engages the attention of the members of a local authority it is invariably urged by some one that the successful candidate must be "a practical man," whatever that may mean. If he be but "practical" all the other virtues will be accorded him. No one has ever been known to suggest that the post should be given to a "theoretical man." Indeed, whenever the latter term is used it is usually held to convey at least a tinge of contempt and distrust.

Now, is there any just cause for this exaltation of the practical at the expense of the theoretical, or is it only another instance of the government of opinion by a popular cant term—an appeal to blind prejudice? Prejudice, as we are aware, plays a far more important part in the world than does reason or judgment. It was prejudice which made our forefathers object to the introduction of railways and gas-lighting, which declared the penny post to be a "wild and visionary project," and the Suez Canal a "futile and impossible idea." If there is anything more than a prejudice behind this preference for the "practical" man, let us try to find out in what it consists.

When analysed to the bottom the term "practical man" appears to mean one who has a familiarity with material things rather than with books; who can work at some trade, and is not afraid of dirtying his hands; or, in its best aspects, it refers to a man who can get a job done in a workmanlike manner without spending too much money. Mainly, however, the essence of the popular meaning of the term lies in the idea that the "practical man" does not depend on book knowledge, while the theoretical man does.

Within certain limits, I think all of us will agree that knowledge obtained by personal contact with realities is to be preferred before that obtained at second hand from the reading of books, and there are certain fields of activity where such a practical knowledge is an absolute necessity. A man may study the theory of billiard playing, or swimming, or even stone-breaking, until he is grey, but without a practical experience of those arts he will be no more efficient at the end than when he started. At the same time, such knowledge as can be acquired by practical experience forms only a small part of the equipment of an efficient and intelligent man, and the so-called "practical man" has a few weak spots in his constitution. Take, for example, his ordinary dislike for knowledge obtained from a book. This is a mere foolish prejudice, handed down from the days of his mediæval ancestors, when books were not to be had. It is recorded of James Brindley that in the fourth year of his apprenticeship to a Macclesfield millwright he set off one Saturday night and walked twenty-five miles to a mill on the Irk at Manchester to look at some new machinery, and walked back again in time to resume his work on Monday morning. However commendable such an action might be in those days, I think that if Brindley were living to-day he would find his information in a less laborious way. He would either give a look in at the nearest free library, or, more probably, turn over the back numbers of his favourite weekly trade paper, and get the information he wanted with his toes on his own fender. And yet there are hundreds of working men to-day who would rather trust the mere verbal, offhand opinion of a brother workman than they would the same advice given in print by half a dozen experts who had taken the trouble to put on record not only their own experience but the best advice that could be collected from the written opinions of others. Such advice, if conveyed in black and white print, is to them merely "book knowledge," or theory. If conveyed in a free and easy conversation with a mate it becomes "practical" knowledge.

Perhaps it is a remnant of the same kind of fetish worship which leads to the habit of visiting works rather than reading descriptions of them and examining photographs and plans. Visits to engineering and municipal works are very excellent things in some ways, but as a means of acquiring a full knowledge of, say, the Forth Bridge or the Eiffel Tower a few hours spent in inspecting these works would not be half so effective as a perusal of the special issues of the *Engineer* or *Engineering*, with their multitude of illustrations and exact figures.

The practical man is apt to be too conservative in his notions. He lacks imagination; what has been good enough for him, and for his father before him, should be good enough for you. He lacks that vision which is "the art of seeing things

* A paper read at Manchester before the Institution of Municipal Engineers, on August 10, by Arthur Bowes, Assoc.M.Inst.C.E.

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invisible," and from the fact of his energies having been so much concerned with hard facts as to stunt his development on the speculative and poetical side of life he is often narrow-minded. It is such as he who, when called in to ventilate a quiet little country church, amid a peaceful surrounding of trees and cornfields, blasts its beauty by surmounting the roof with hideous torpedo-shaped monstrosities of sheet iron. I suppose it was a town council of "practical men" who, not many years ago, wanted to pull down that noble West Gate which spans the main street of Canterbury in order that Wombwell's Wild Beast Show might enter the town. Heaven be thanked that by the casting vote of a humanitarian mayor the gate was saved.

When he attempts to explain some of the simple phenomena of nature the "practical man," from his want of training in logical thought, is sometimes a little at sea. I remember a few years ago one of the trade journals resuscitated the old problem as to why the top of a wheel moves quicker than the bottom, and the reason given, with all seriousness, was that "the upper spokes revolved with greater rapidity than the bottom."

When the "practical man" is called upon to design structures requiring some knowledge of stresses and strains he is occasionally thrown into considerable difficulties, for innate genius and rule of thumb are not always reliable guides in such matters. The less a man knows, the more he will guess at, and it follows that some very wild guesses are formulated, and sometimes materialised in brick and stone and iron. Of two actual designs for the guide framing of a gas-holder, both prepared by presumably "practical men," one would have weighed 128 tons and the other 712 tons. A little theory would surely have formed a useful blend in this case.

There are two kinds of theorists: first, the one whom the ordinary man in the street has in mind when he condemns the theoretical man—that is to say, the one who attempts to square every action by mathematical rule and formula—while the second class of theoretical men are those great leaders of scientific thought without whose efforts humanity would make little progress in knowledge or in social life. Science depends on the exact or mathematical statement of our knowledge of phenomena, and it is the delight of the theorist to construct a formula which shall correctly describe the sequence and correspondence of the phenomena of the universe. Such names as Newton, Faraday, Kelvin, and Clerk Maxwell are spoken of as theorists, but with a very different inflection of voice and meaning from that used in speaking of our hypothetical, non-practical candidate for a municipal post. There is much truth in the ordinary distrust of the theoretical man—if he allows his theoretical proclivities to run away with him, and has not sufficient practical knowledge to keep them in check. The "White Knight" in "Alice Through the Looking Glass" was a theorist pure and simple. So was the young man from the engineering college who, when the locomotive was stuck in the snow and short of water, shovelled snow down the smoke stack.

One of the besetting weaknesses of the theoretical man is his assumption of a superlative exactness in matters which do not admit of a nicety of mathematical definition. A wire-edged precision binds all his thoughts and notions, however trivial. He is like the witness who stated that the prisoner at the bar said, "My dear Thomas—or words to that effect." In Sir Thomas More's "Utopia" we find that the ideal family was to be restricted to a maximum of sixteen and a minimum of ten—a very pleasant theory, but not sufficiently mindful of the human factor. In my younger days one well-known text-book on constructional ironwork worked out many calculations for riveted joints to the fourth place of decimals of an inch. Rankine, our mathematical high priest, in dealing with certain hydraulic questions, gives a table of heights in feet due to certain velocities, and is careful to say that they are calculated for latitude 54¾ degrees. An impressive example of the super-exact formula is one recently published—to be sure, it was made in Germany—for calculating the heights of chimney stacks. I will not inflict it upon you, but content myself by saying that it fills a line of rather small print 3½ inches long.

The absurdity of attempting to carry mathematical statements to such a pitch of refinement arises from two considerations. First, we do not know all the necessary factors with anything like accuracy, and a wrong assumption in any one factor vitiates the whole calculation. It is like trying to make mince-pies when we are not quite sure whether a certain white powder is sugar or carbonate of soda. The result is doubtful—it may come out right, or it may not. Secondly, too much reliance is placed on the value of constants which have been copied year after year from one text-book to another, and in the first instance may have been based on very inadequate experiments. For example, the formulæ for the strength of wooden columns were until fairly recently copied from text-book to text-book, with perhaps some variation in the mode of statement, but all based on experiments made in 1840 on seven pieces of wood cut from one plank, the largest piece used in the experiments being about 2 inches square and 5 feet long. If a few sticks from another plank had been used how would the constant have turned out?

Pile-driving, on its theoretical side, affords some good examples of the highly useless formula. A writer took the trouble to compare eight different formulæ, and found that they gave results varying from 20,000 lb. to 399,840 lb. The old-fashioned rule of guessing at the quarter and multiplying by four would seem to be about as practical a way of arriving at the truth. It is the function of practical common sense to guard us against placing too much trust in a formula without making sure that all the elements of the formula are reliable. You are aware that the Board of Trade prescribes a limit of stress of five tons per square inch on any part of the iron of a railway bridge, and all the stress calculations are made with this limit in view, yet Sir Benjamin Baker—who was, perhaps, the happiest combination of practical and theoretical knowledge since the younger Brunel—proved by experiment that in a well-riveted joint the rivets were subjected by their own contraction to a stress of twelve tons per square inch.

It is no wonder, then, that actual facts in the engineering world do not always square with theoretical expectation. Sometimes a structure fails when by all the rules of arithmetic it ought to stand safe and sound; sometimes it refuses to fail when mathematically it has no right to exist ten minutes. When the Bouzey dam collapsed, a few years back, there were at once dozens of experts who proved satisfactorily why it failed, but no one could account for its having stood so long. And again, in designing arches of brick or stone the law of the "middle third" is an institution of which we would no more speak slightingly than a nautical man would speak disrespectfully of the equator, yet Sir Benjamin Baker has ventured to say that "the middle third is merely an assumption made to facilitate calculations, and has led to a great deal of waste" in the design of arches. In another place he has said that 90 per cent. of the arches now standing in the kingdom do not fulfil the theoretical requirements.

Another example of the non-accordance of theory with practice is to be found in the strength of egg-ended boilers. In such boilers the ring seams are theoretically twice as strong as the longitudinal seams, and yet in cases of explosion the former are often the first to yield. It is the consideration of such anomalies as the above that lead one to agree with Sir Benjamin Baker in declaring that "writers of text-books may properly suggest formulæ, but it is for practical men to decide whether they can or cannot be accepted as reliable."

The general conclusion to which the above remarks tend has been pretty clearly anticipated. It is the old conclusion of the Greek philosophers, that the truest wisdom lies in the happy medium. Practice and theory are both good in their way, and the wisest and cleverest engineer is he who combines as far as possible both in his mental equipment. A modicum of theory will save him from some disastrous and wasteful blunders, but his theory must be controlled by what Locke calls a "large, sound, roundabout sense," or he may be led into equally foolish and extravagant blunders by his over devotion to the rule of figures and formulæ. Practical knowledge without theory is only half an equipment for an engineer, as George Stephenson recognised when he decided that his son Robert should be well educated in theory; while theory without practice leads to a rigid conception of things, bounded by red-tape rules, which is very far from a true reflex of the reality. All knowledge is useful, but the attainment of all knowledge is impossible for us, and the limitations of our little lives make it imperative that we should concentrate our efforts on those particular departments which will be of most use to us in our individual work. We cannot expect to attain proficiency in many branches of practical handicraft—no man can be at once a skilled carpenter, stonemason, bricklayer, slater, mechanic, and plumber. All that he can do is by constant observation to make himself as familiar as possible with the methods and details of such handicrafts and with the properties of the materials used in them, and at the same time furnish himself with a large and comprehensive view of engineering principles by studying the written records of works already executed and the results of experiments carried out by others. Above all, he must not forget to temper and harmonise the whole by the use of what Emerson calls "the restraining grace of common sense."

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The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

Antwerp.—Oct. 1.—An international competition is being arranged for a scheme for the laying out of the land surrounding Antwerp, which will shortly be available by the demolition of the encircling fortifications. Premiums of 1,000*l.*, 400*l.*, and 200*l.* are offered. Copies of the conditions, &c., may be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C., or, on payment of 100 francs from the "Commission d'études de l'aménagement de l'agglomération anversoise," 57 Rue du Jardin des Arbalétriers, Antwerp.

Belfast.—Sept. 15.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of *bona-fide* design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

Folkestone.—Sept. 10.—Designs are invited for a secondary school to accommodate 150 boys. Deposit 2*l.* 2*s.* Mr. A. F. Kidson, town clerk, Folkestone.

Gorleston-on-Sea.—August 31.—The Governors of the East Anglian Institution for Blind and Deaf Children invite plans and designs for a new building to be erected at Gorleston-on-Sea. The competition will be confined to architects having an office or residing in the areas of the following education authorities:—Cambridgeshire, Isle of Ely, Lowestoft, Norfolk, Norwich, East Suffolk, and Great Yarmouth. Copies of the instructions to architects within the prescribed areas will be sent on a remittance for 10*s.* (returnable). Documents to be sent back. Mr. D. O. Holme, clerk of the governors, Castle Chambers, Norwich.

Ireland.—Sept. 1.—The Kingstown Urban Council offer prizes of 50*l.* and 20*l.* for the best sets of plans for a Carnegie Library to be erected in Lower George's Street. Deposit 1*l.* 1*s.* Mr. J. Sherlock Vaughan, town clerk, Town Hall, Kingstown.

Ireland.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.;



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(*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l*. The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

Ireland.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

Manchester.—The Corporation invite plans, specifications and estimates for the laying out of their Blackley Estate. Deposit 3*l*. 3*s*., returnable on receipt of a bona-fide design. Premiums of 150*l*., 100*l*. and 50*l*. The City Surveyor's Office, Town Hall, Manchester.

Romford.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l*.—first prize, gold medal and 250*l*.; second prize, 100*l*. Class II.—Detached cottage, to cost 375*l*.—first prize, gold medal and 200*l*.; second prize, 100*l*. Class III.—For the best internally fitted cottage in above classes—prize, 50*l*. Class IV.—Town plan of Gidea Park—prizes, 100*l*. and 50*l*. Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l*. and 10*l*. Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l*. and 5*l*. Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l*.; second prize, 50*l*. Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

Ruislip.—The Directors of Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l*., 100*l*., and 50*l*. Deposit 1*l*. 1*s*., which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

Sheringham.—Sept. 5.—The Urban District Council invite designs for proposed new Council offices. Apply, enclosing a stamped and addressed envelope, to Mr. Edgar C. Rolfe, clerk, Church Street Chambers, Sheringham, Norfolk.

Wales.—Sept. 19.—The town hall committee invite competitive designs, &c., for the proposed alterations and additions (not exceeding in cost 3,000*l*.) to the town hall and market hall, Maesteg. Conditions, with a plan of site and sections at ground level, may be obtained from Mr. Samuel J. Harpur, engineer and surveyor, Town Hall, Maesteg. Two premiums are offered, namely, 25 guineas and 10 guineas, as first and second respectively. The committee do not bind themselves to award the premiums, and they do not intend to engage the authors of the designs for which premiums may be awarded to carry out or supervise the work.

Wales.—Oct. 1.—The Town Council of the borough of Denbigh invite competitive plans and designs of a public hall, markets, municipal buildings, &c., which it is proposed to erect at a cost not to exceed 10,000*l*. Three premiums are offered, viz. 75*l*., 30*l*. and 20*l*., as first, second and third respectively. Send 1*l*. 1*s*. deposit for particulars, &c., Mr. J. Parry Jones, town clerk, Denbigh.

The *Diario Oficial*, Uruguay, of July 16, contains a resolution accepting the estimate of 1,157,900 pesos (about 246,000*l*.) submitted by Señor Leopoldo Peluffo for the construction of the masonry section of the new parliament building which is to be erected.

CONTRACTS OPEN.

Altrincham.—Sept. 3.—For additions to the Conservative Club. Deposit 1*l*. 1*s*. Mr. Thomas Blagburn, architect, 20 and 21 Station Buildings, Altrincham.

Andover.—Sept. 7.—For erection of a post office at Tidworth Camp, Andover, for the Commissioners of H.M. Works and Public Buildings. Mr. E. Cropper, 22 Carlisle Place, S.W., or the Postmaster, Tidworth Camp Post Office.

Banbury.—Aug. 31.—For erection of business premises at Middleton Cheney, for the committee of the Banbury Co-operative Industrial Society, Ltd. Mr. Frederick J. Cooke, architect and surveyor, 33 Bridge Street, Banbury.

Blackburn.—Aug. 27.—For any of the separate trades required in connection with the building of an elementary mixed school, Holy Trinity Church. Send in names by Aug. 27 to Mr. Fred. J. Parkinson, architect, 9 Richmond Terrace, Blackburn.

Boston.—Aug. 29.—For alterations to the police cells at the Sessions House, for the Holland County Council. Mr. E. J. A. Christie, county surveyor, Market Place, Boston, Lincs.

Boston.—Aug. 30.—For alterations and additions to the barracks for the Lincolnshire Territorial Association. Deposit 2*l*. 2*s*. Messrs. Scorer & Gamble, architects, Bank Street Chambers, Lincoln.

Broughton.—Sept. 5.—For the erection of a small holding, dwelling and outbuildings, at Broughton, near Chester. Mr. Sam Evans, F.S.I., county surveyor, County Offices, Mold.

Bury.—Sept. 6.—For the enlargement of the Bury (Lancs.) Post Office. Deposit 1*l*. 1*s*. The Postmaster, Bury Post Office; or H.M. Office of Works, Storey's Gate, London, S.W.

Cheltenham.—Aug. 31.—For repairs at the workhouse. The Master at the Workhouse, Cheltenham.

Cosham.—Sept. 19.—For alterations and new heating apparatus to cells at the Cosham police station, Hants. Deposit 1*l*. 1*s*. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Darlington.—Aug. 27—For various trades in connection with extensive repairs, alterations, and additions to Brettanby Manor House and other buildings, about 7 miles from Darlington. Send names by Aug. 27 to Messrs. J. P. Pritchett & Son, architects, &c., 24 High Row, Darlington.

Dublin.—Sept. 1.—For erecting a nursing home in connection with St. Vincent's Hospital, Stephen's Green, Dublin. Deposit 3*l*. 3*s*. Messrs. W. H. Byrne & Son, architects, 20 Suffolk Street, Dublin.

Eastbourne.—Sept. 1.—For erection of public conveniences situate in the Ocklynge cemetery grounds. Mr. A. Ernest Prescott, borough surveyor, Town Hall, Eastbourne.

Frithville.—Sept. 15.—For alterations to the Council school at Frithville, in the county of Lincoln. Send 1*l*. 1*s*. deposit by Sept. 5. Messrs. Scorer & Gamble, architects, Bank Street Chambers, Lincoln.

Frome.—Sept. 5.—For the construction of a brick culvert 50 yards in length at Beckington. Mr. J. Ace Beynon, surveyor, Nunney Road, Frome.

Hallatrow.—Sept. 8.—For erection of the Station Hotel and premises at Hallatrow, near Bristol. The Welton Breweries Co., Ltd., Midsomer Norton.

Handsworth.—Sept. 9.—For the following works, viz.:—Handsworth: Woodhouse Council school, alterations to cloak room (builder, joiner and plumber), for the West Riding education committee. The Education Architect, County Hall, Wakefield.

Hartley.—Sept. 3.—For erecting out offices, constructing a drainage system, &c., at Old Hartley Council school, Northumberland. Deposit 1*l*. 1*s*. Mr. C. Williams, secretary to the education committee, Moothall, Newcastle-on-Tyne.

Horsmonden.—Aug. 30.—For the widening of Small Bridge, Horsmonden, Kent. Mr. Frederick W. Ruck, county architect, 86 Week Street, Maidstone.

Hull.—Aug. 31.—For erection of a horseman's lodge in the Pickering Park. Deposit 2*l*. 2*s*. Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

Hull.—Aug. 31.—For erection of a park keeper's lodge in the Pickering Park. Deposit 2*l*. 2*s*. Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

Irvinestown.—Sept. 6.—For the erection of thirty-six single cottages for labourers, and for fencing thirty-six plots to same, for the Rural District Council. Mr. Thomas Aiken, clerk of the Rural District Council, the Boardroom, Irvinestown.

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Isle of Man.—Sept. 4.—For erection of a block of dwellings in Lord Street, Douglas. Mr. F. Cottle, C.E., borough surveyor, Town Hall, Douglas.

Kea.—Sept. 3.—For erection of a pair of cottages at Nansavallan, in the parish of Kea, Cornwall. Mr. George Gow, Tregothnan Office, Truro.

King Cross.—For the different trades required in building new St. Paul's Church, King Cross, Yorks. Messrs Jackson & Fox, surveyors, 7 Rawson Street, Halifax.

Leeds.—Aug. 31.—For alterations and furnishing (carpenters and joiners) to the offices of the City Treasurer's and City Engineer's Departments, Municipal Buildings. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

Legsby.—Sept. 15.—For erection of a Council elementary school at Legsby, for the Lindsey County Council education committee. Send 1*l.* 1*s.* deposit by Sept. 5. Messrs. Scorer & Gamble, architects, Bank Street Chambers, Lincoln.

London.—Aug. 31.—For erection of a boiler house, &c., on Duck Island, St. James's Park, S.W. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

London.—Aug. 31.—For the erection of a discharge block and staff quarters at the Eastern Fever Hospital, Homerton Grove, Homerton, N.E. Deposit 1*l.* 1*s.* Mr. W. T. Hatch, M.Inst.C.E., M.I.Mech.E., engineer-in-chief, Metropolitan Asylums, Office of the Board, Embankment, E.C.

London.—Sept. 6.—For erection of the Patent Office extension, Furnival Street. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

London.—Sept. 6.—For additions and alterations to stables at Paddington for the Great Western Railway. The New Works Engineer, Paddington Station, London, W.

London.—Sept. 6.—The managers of the Poplar and Stepney sick asylum district are prepared to receive tenders for proposed nurses' class room and addition to drug stores, &c., at their District Sick Asylum, Devons Road, Bromley, E. Deposit 5*l.* Messrs. J. & W. Clarkson, architects, 136 High Street, Poplar, E.

London.—Sept. 6.—For the demolition of Nos. 140, 142 and 144 Lewisham High Road, S.E. Borough Surveyor, Town Hall, New Cross Road, S.E.

Manchester.—Sept. 10.—For the erection of the Elysian Street Municipal school, Openshaw, and the Ravensbury Street Municipal school, Clayton. Deposit 2*l.* 2*s.* at the Education Offices, Deansgate, Manchester.

Margate.—Sept. 6.—For the construction of a washhouse and w.c. at the Corporation yard, Victoria Road. Borough Surveyor, 13 Grosvenor Place, Margate.

Morecambe.—Sept. 5.—For erection of a new art and technical school. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

North Shields.—Sept. 6.—For alterations to and constructing conveniences upon the premises, 15 and 16 Borough Road. Deposit 1*l.* 1*s.* Mr. John F. Smillie, borough surveyor, Tynemouth.

Old Hartley.—Sept. 3.—For erecting new out offices, constructing a drainage system, &c., at Old Hartley Council school, Northumberland. Deposit 1*l.* 1*s.* Mr. C. Williams, secretary to the education committee, the Moothall, Newcastle-on-Tyne.

Polseath (Cornwall).—For erection of a bungalow at Polseath, near Wadebridge. Mr. Arthur Gilbert, architect, 2 Montpelier Terrace, Torpoint.

Poole.—Aug. 29.—For erection of an elementary school at South Road, for 580 children. Deposit 5*l.* Mr. Samuel J. Newman, F.R.I.B.A., borough surveyor, Municipal Buildings, Market Street, Poole.

Preston.—Sept. 3.—For erection of a grammar school for boys in Moor Park Avenue. Deposit 2*l.* 2*s.* The Education Offices, Lancaster Road, Preston.

Rookhope.—Sept. 10.—For the whole or any separate part of the several works required in erection and completion of proposed new branch business premises at Rookhope, Durham. Mr. W. B. Barron, architect, 3 West View, Blackhill, or Mr. E. Golightly, secretary, Co-operative Society, Ltd., Front Street, Stanhope.

Salford.—Aug. 27.—For erecting an infants' school in Robert Hall Street. Send 1*l.* 1*s.* deposit by Aug. 27 to Mr. J. B. Broadbent, A.R.I.B.A., 15 Cooper Street, Manchester.

Scotland.—For pair of small cottages, Buckie. Messrs. D. & J. R. M'Millan, architects, 105 Crown Street, Aberdeen.

Scotland.—Aug. 29.—For the mason, carpenter, slater, plasterer, plumber, painter and glazier works to be done in the erection of new supplementary and manual instruction rooms, &c., at Enzie Public school, Clochan. Mr. William Hendry, architect, 91 West Church Street, Buckie.

Scotland.—Aug. 29.—For the several works required for the erection of additions to Townhill school. Messrs. T. Hyslop Ure & Beveridge, architects, 43 Carnegie Street, Dunfermline.

Scotland.—Aug. 29.—For repointing the United Free Church spire, Laurencekirk, and supplying and fitting lightning conductor for same. Mr. John A. Dawson, 34 High Street, Laurencekirk.

Scotland.—Sept. 1.—For the construction of a brick or wooden shed, 30 feet by 18 feet, at Shettleston, Lanark. The Shettleston police station, Lanark, N.B.

Sevenoaks.—Aug. 29.—For the erection of a mortuary at the Council's depot, Gordon Road. Deposit 2*l.* 2*s.* Mr. S. Towlson, A.M.I.C.E., Council Offices, Argyle Road, Sevenoaks.

Southampton.—Sept. 19.—For alterations and heating apparatus to cells at the Winchester county police station. Deposit 1*l.* 1*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

South Brent.—Aug. 30.—For erection of a hall at South Brent, Devonport. Mr. R. Hansford Worth, 42 George Street, Plymouth.

St. Helens.—Sept. 12.—For erection of a secondary school for boys in Cowley Hill Lane, St. Helens, Lancs. Deposit 1*l.* 1*s.* Mr. Frank S. Biram, architect, George Street, St. Helens.

Wales.—Aug. 27.—For erection of an electric lighting substation at Heoldon, in the parish of Whitchurch, for the Llandaff and Dinas Powis Rural District Council. Mr. J. A. Sant, architect, 1 St. John Square, Cardiff.

Wales.—Aug. 27.—For carrying out alterations and additions to the Treherbert branch of the Ton Co-operative Society, Ltd. Send 1*l.* 1*s.* deposit by Aug. 27. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre, Rhondda.

Wales.—Aug. 30.—For erection of business and dwelling premises at Troedyrhiw, near Merthyr. Deposit 1*l.* 1*s.* Messrs. Johnson & Richards, architects, Merthyr Tydfil.

Wales.—Aug. 31.—For rebuilding the Lamb and Flag Inn, Bryncoch, Neath. Mr. Mansel H. Hunter, architect and surveyor, Neath.

Wales.—Sept. 2.—For erection and completion of from forty to fifty houses at Duffryn Rhondda, near Port Talbot, for the Duffryn Rhondda Building Clubs. Mr. Frank B. Smith, C.E., architect and surveyor, Port Talbot.

Wales.—Sept. 5.—For erection of an infants' school at Darren View, Merthyr Tydfil, also for erection of a boys' school and a girls' school adjoining Thomastown Park (exclusive of the Domestic Subjects block, which will be subsequently tendered for). Deposit 2*l.* 2*s.* The Deputy Surveyor, Town Hall, Merthyr Tydfil.

Wales.—Sept. 6.—For the erection of forty-five houses, together with the construction of roads, sewers, surface water drains, &c., at Ynys-y-gored, Aberfan, for the Grove Building Club. Mr. T. Edmund Rees, architect and surveyor, The Walk, Merthyr Tydfil.

Wales.—Sept. 9.—For erecting a public hall at Penygroes, Carmarthenshire. Mr. W. D. Jenkins, F.R.I.B.A., Llandilo.

Wales.—Sept. 12.—For the erection of thirty-one houses and the construction of the necessary roads at Cwmtillery, for the Abertillery Urban District Council. Deposit 1*l.* 1*s.* Mr. Lionel D. Lewis, engineer, King Street, Abertillery.

Wales.—Oct. 1.—For building a school (accommodation 500) at Hendy, Pontardulais, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., County Architect, County Education Offices, Carmarthen.

Walthamstow.—Aug. 31.—For the supply, delivery, and erection of the steel work, &c., required in the construction of a store shed at the depôt, Exeter Road. Deposit 1*l.* 1*s.* Mr. E. Morley, surveyor to the Council, Town Hall, Walthamstow.

Walthamstow.—Aug. 31.—For the supply, delivery, and erection of the steel work, &c., required for the extension of the car depot, Chingford Road. Deposit 1*l.* 1*s.* Mr. G. W. Holmes, A.M.I.C.E., engineer to the Council, Town Hall Annexe, Walthamstow.

The district committee of the Dumfries County Council have instructed Messrs. D. Balfour & Son, of Newcastle-on-Tyne and London, to report on the main sewerage of the town of Thornhill, and also as to the condition of the existing sewage disposal works.

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TENDERS.

BATLEY CARR.

For erection of Batley Carr Council School, for the Dewsbury Education Committee. Messrs. Holtom & Fox, architects, Dewsbury.

Accepted tenders.

Garforth Bros., mason	£3,538 18 10
Armitage & Sons, joiner and carpenter	1,050 0 0
Rushworth, plumber and glazier	510 0 0
Greenwood, concreter	393 0 0
Bagshaw & Son, ironwork	264 15 0
Fawcett, slater	249 0 0
Crawshaw, plasterer	215 0 0
Northern Asphalte and Roofing Works Co., asphalter	117 0 0
Foggo, electrical engineer	100 0 0
Jackson, painter	73 0 0

HOLMES CHAPEL.

For water supply, for Congleton Rural District Council. Mr. W. Woodley Wyatt, engineer, Whitchurch.

Dean	£1,160 0 0
Griffiths & Co.	1,071 14 1
Oxley	1,015 5 2
Brebner & Co.	980 0 0
Barke	953 16 0
A. H. & S. Johnson	934 0 0
Owen	933 16 5
Underhill	856 3 6
Williams	850 0 0
Atkinson & Co.	809 13 9
Ewart	798 0 0
Nevitt	784 1 6
Hopper	782 4 2
Whildhead	752 9 8
Hughes	750 0 0
York & Co.	746 15 4
Whitehead & Son	731 18 4
O'Malia	727 19 10
Bennie & Thompson	706 19 10
Rutter & Son	705 11 0
Crawford	700 0 0
Morley & Sons	699 0 10
Hayes	685 3 8
Mitchell & Son	666 16 3
Farley & Co.	660 0 0
Taylor & Son	618 0 0
Marland	585 0 0
Hutton & Co., Northwich (*accepted*)	521 8 3

LUTON.

For laundry extension, for the Guardians.

George	£488 0 0
Brown & Son	476 15 0
Barber	465 10 0
Cole	462 0 0
Johnson (*accepted*)	458 10 0

MILDENHALL.

For re-erection of the White Hart Inn. Messrs. Morgan & Buckingham, architects and surveyors, 1 Upper King Street, Norwich.

Clarke	£1,375 0 0
Hawes & Sons	1,358 0 0
Gill & Son	1,350 0 0
Youngs & Son	1,263 0 0
Hannant	1,173 0 0
Holden & Son, Thetford (*accepted*)	1,125 0 0

NEW HEY.

For the construction of extensions to the sewage works at New Hey, Lancs., for the Crompton Urban District Council. Contract No. 1. Messrs. J. P. Wilkinson & Son, engineers, Manchester.

R. & T. Howarth	£22,364 12 0
Byrom	19,250 0 0
Worthington	18,691 15 3
Buckley	18,613 4 11
Hayes & Sons	18,287 11 8
Cottle	18,000 0 0
Bentley & Co.	16,789 0 0
Annakin	15,941 0 0
Henson & Son	14,338 0 0
Whitworth, Whittaker & Co.	14,033 0 0
Partington	13,700 0 0
Freeman & Sons, Hollinwood (*accepted*)	13,200 0 0

SCOTLAND.

For the construction of treatment works, providing, &c., three miles of fireclay and cast-iron sewer pipes between the hospital and Anstruther, Fifeshire, for St. Andrews District Committee of the Fife County Council. Messrs. Bruce & Proudfoot, civil engineers, 67 Crossgate, Cupar, and Kirkcaldy.

Skinner	£2,298 12 6
Robb	2,126 4 11
Gray & Co.	2,114 12 6
Strachan & Son	2,071 9 10
Fraser	2,068 16 7
Robertson	1,998 18 10
Jackson	1,970 0 4
Brown & Kincaid	1,968 17 6
Flett	1,932 0 0
Ritchie	1,916 11 6
Wilson	1,913 10 9
White & Son	1,870 14 6
Casey & Darragh	1,857 17 9
Gilmour	1,852 10 3
Gray & Sons	1,719 0 0
Martin	1,684 8 5
Morrison, Kirkcaldy (*accepted*)	1,656 13 8
Knowles	1,335 13 4

For erection of a laboratory at the Dundee University for mechanical engineering.

Accepted tenders.

Bennett, builder	£5,899 0 0
Philip, joiner	1,697 0 0
M'Ritchie, plasterer	921 18 0
Brown, plumber	718 0 0
Hogg & Sons, slater	185 0 0
M'Donald & Smith, glazier	115 18 4

WALES.

For providing and laying water mains, with bends, fittings, and wall fountains in connection with the Gorslas and Cefneithin waterworks, for the Carmarthen Rural District Council. Mr. Gomer Henry, engineer, Carmarthen.

Dories	£2.230 0 0
Page	2,185 19 6
Powell	2,154 5 9
Robinson & Hodgens	2,113 1 4
Thompson	2,091 17 0
Isaac	2,003 3 2
Evans & Murray	1,886 16 6
Walker	1,881 4 6
W. & J. R. Watson	1,669 0 2
Farley & Son	1,618 1 10
Denham, Bishop Auckland (*accepted*)	1,575 15 9

WEST HAM.

For the electric lighting, heating, and supply of furniture to the West Silvertown schools. Mr. W. Jacques, A.R.I.B.A., 2 Fen Court, E.C.

Electric lighting installations.

Ewart & Son	£420 0 0
Giffin Bros.	420 0 0
Simmons & Co.	375 10 0
Tilley Bros.	364 0 0
Allam & Co.	327 0 0
West Ham Electricity Department	316 0 0
Halsey, Stratford (*accepted*)	287 17 6

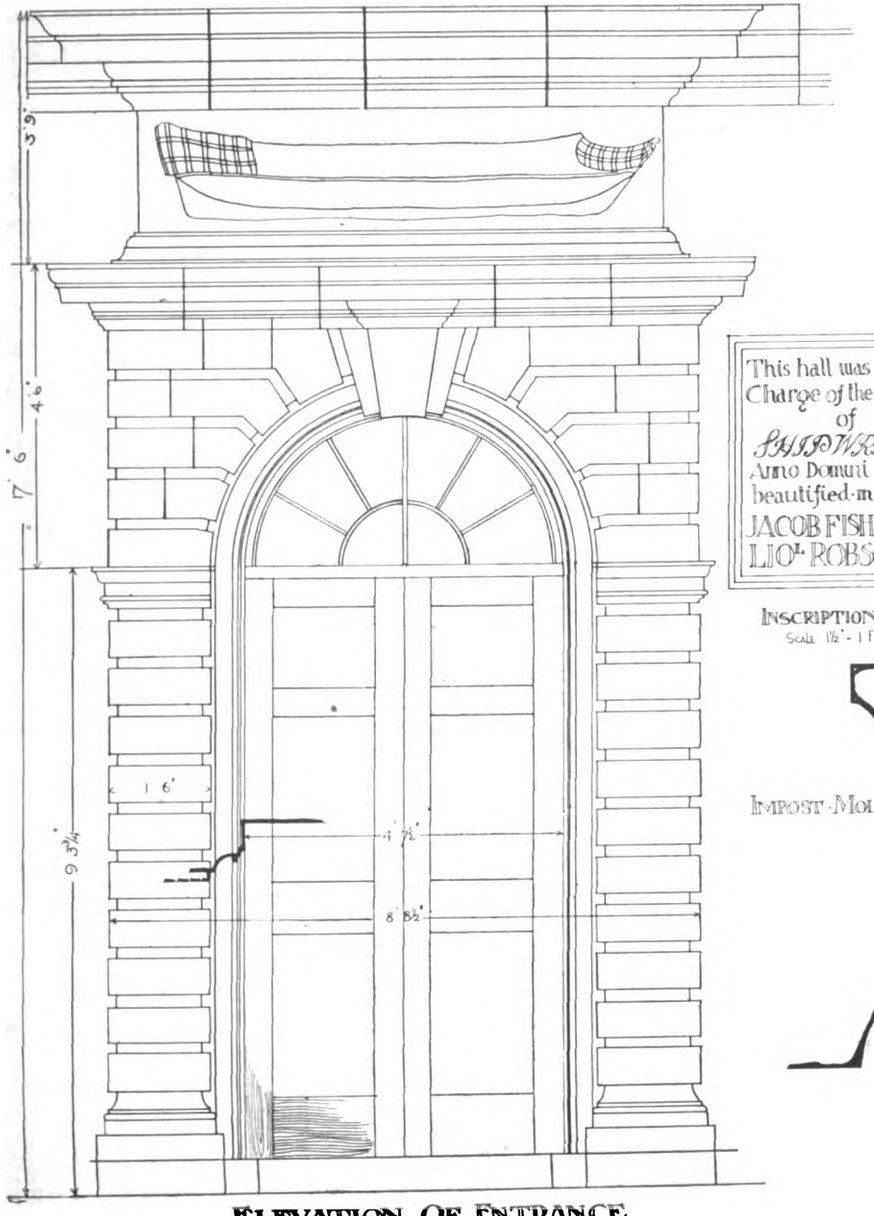
Heating installations.

Dinning & Cooke	427 0 0
Werner, Pfleiderer & Perkins	405 0 0
Simmons & Co.	349 17 0
Norden	329 0 0
Korting Bros.	325 0 0
Halsey	310 5 6
Davies	298 0 0
Wembley Heating Co.	290 0 0
Tilley Bros.	283 13 0
Freer	283 10 0
Watkin & Son	275 0 0
Burroughs & Sons	260 0 0
Cannon & Hefford, Peckham (*accepted*)	245 0 0
Grundy	237 0 0
General Iron Foundry Co.	213 0 0

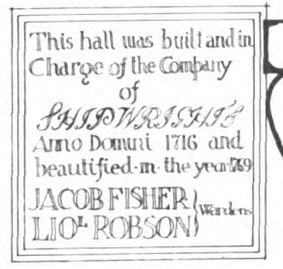
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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

PREMISES · FORMERLY · VSED · AS · SHIPWRIGTS' HALL · NEWCASTLE · VPON · TYNE



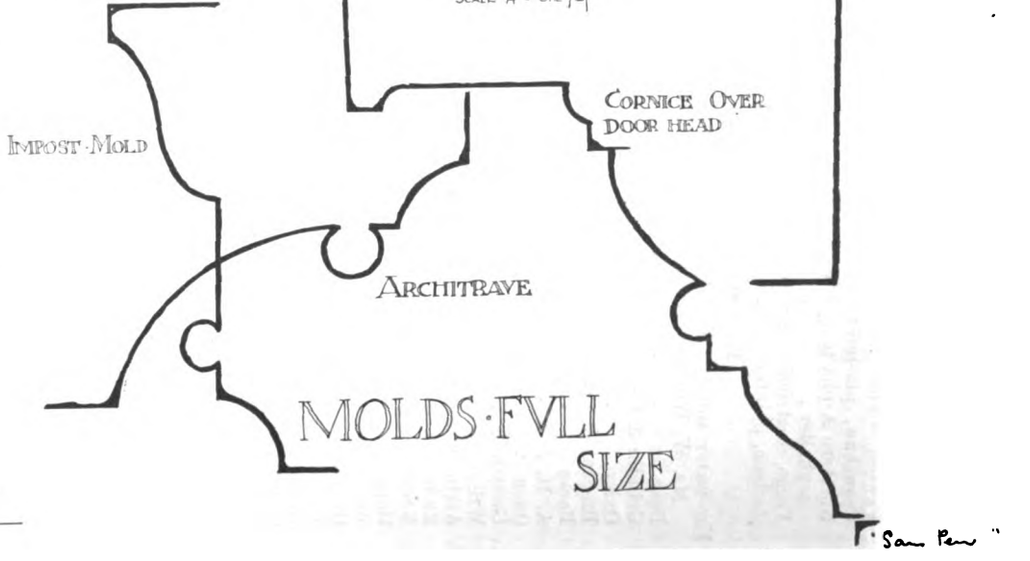
ELEVATION OF ENTRANCE
Scale · One Inch · One Foot



INSCRIPTION TABLET
Scale 1½" - 1 Foot

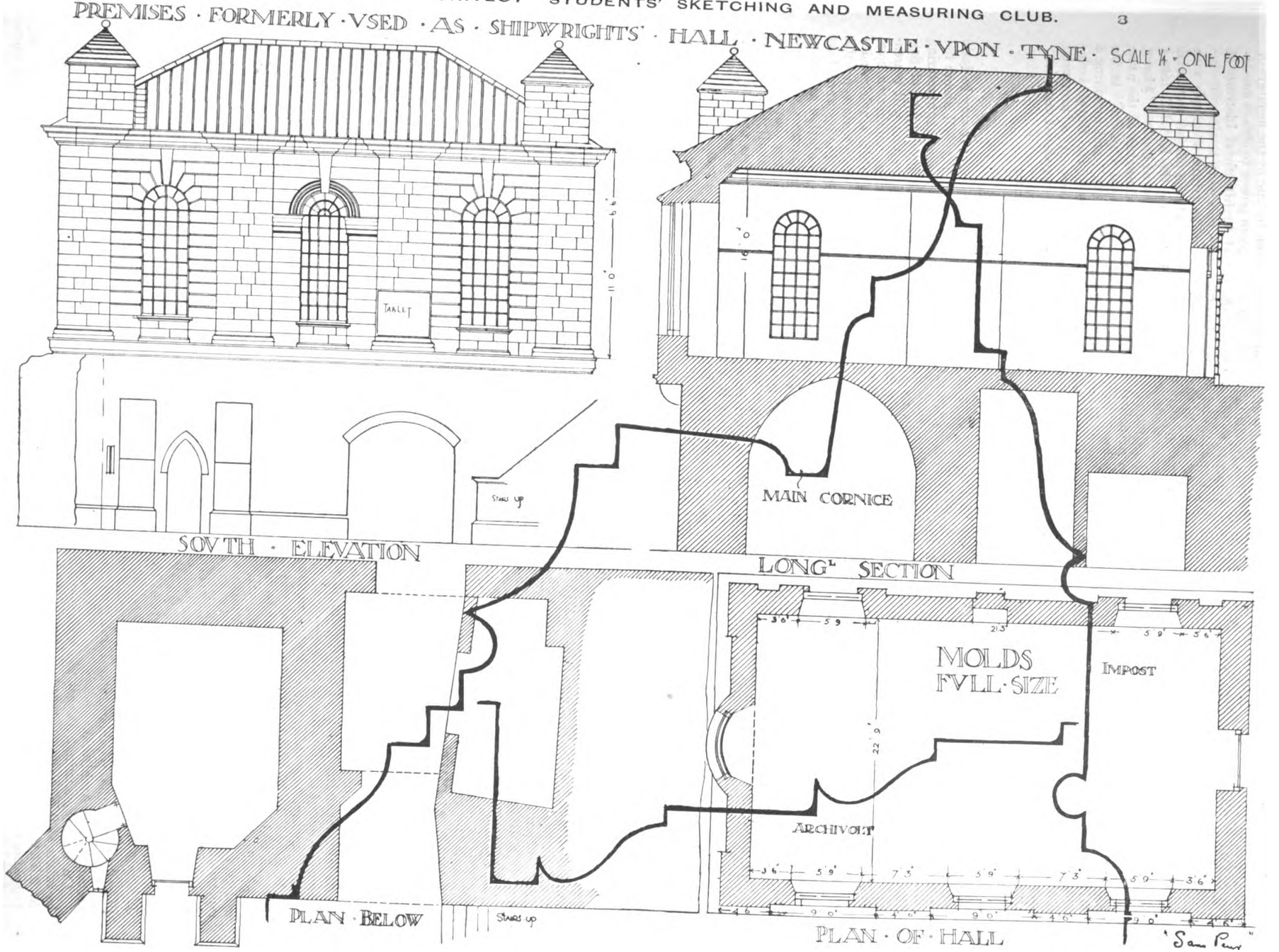


EAST ELEVATION
Scale ¼" - One Foot



MEASURED DRAWING BY "SANS PEUR"

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MEASURED DRAWING BY "SANS PEUR."

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LIBRARY OF THE UNIVERSITY OF CHICAGO

WHITWICK.

For erection of new works, for Messrs. H. Seal & Co., Leicester.

Kershaw & Son	£4,040	0	0
Corah & Son	3,999	0	0
Clark & Garratt	3,900	0	0
Chapman & Son	3,847	0	0
Griffin Bros.	3,840	0	0
Moss & Co., Coalville (*accepted*)	3,758	0	0

WINCHCOMBE.

For sewerage and sewage disposal works. Messrs. Willcox & Raikes, engineers, Birmingham.

J. & T. Binns	£7,124	2	5
Wood & Sons	6,446	10	11
Riley	6,368	2	0
Vale & Sons	6,283	0	0
Cooper & Co.	6,148	0	0
Bell & Sons	6,147	0	0
Pollard & Co.	6,083	0	0
Brebner & Co.	5,968	5	0
Crawford	5,955	15	10
Buckley	5,948	8	1
Mackay	5,902	12	3
Smith	5,820	0	0
Morley & Sons	5,796	9	0
Price & Co.	5,781	13	6
Rowell & Sons	5,646	19	10
Winser	5,640	0	0
Williams & Co.	5,618	15	6
Johnson Bros., Hereford (*accepted*)	5,590	0	0
Engineer's estimate	5,948	0	0

OLD HALL OF THE SHIPWRIGHTS, NEWCASTLE-UPON-TYNE.

This hall is a small but excellent example of eighteenth-century work. Though the orders are not used yet a good effect is gained by the use of the wide pilasters with bases, and having the cornice returned over them, as well as the centre key-block. Only the two end bays are rusticated of the elevation shown, the centre bay being in plain ashlar treated with an archivolt over the window springing from an impost mould. The entrance doorway is noteworthy, having above the door a plaster model of an eighteenth-century ship, and bears interesting comparison with the ships of modern date. The hall was erected as per inscription tablet in 1716, and is built over an old tower called Sallyport, which was one of the original postern towers of the old town wall. The hall is at present in a dilapidated condition, being used for some time as a slipper factory, but is now empty.

ROYAL ARCHITECTURAL INSTITUTE OF CANADA.

The third annual assembly of the Royal Architectural Institute of Canada will be held at Winnipeg in the Assembly Hall of the University of Manitoba on August 25, 26 and 27. The headquarters of the members during the meeting will be the Royal Alexandra Hotel. The programme for the Convention includes the following details:—

On Thursday, August 25, at 9.30 a.m., a meeting of Council will be held. At 10.30 a.m. the inaugural session will take place, at which addresses of welcome will be delivered, and the president, Mr. F. S. Baker, F.R.I.B.A., will reply. This will be followed by a business session, which will include reports of various committees and officers.

At 2.30 p.m. another business session will be commenced, at which the following subjects will be taken up:—"Federation of the Various Canadian Architectural Bodies"; "Amendments to the Charter"; "The Architecture of the West," by J. Greenfield, M.A.A., F.R.A.I.C.; "Architectural Jurisprudence," by I. Campbell, K.C. At 8 p.m. a reception will be tendered by the president and council of the Manitoba Association of Architects.

On Friday morning, August 26, a sight-seeing drive will be taken at 9.30 o'clock through Winnipeg and its suburbs. At 2.30 p.m. a business session will be held, of which the following is the programme:—"Federation of Foreign Architectural Societies," by A. Chausse, L.R.I.B.A.; an address by Professor P. E. Nobbs, of McGill College; election of honorary and honorary corresponding members; general business; report on election of officers; discussion of next place of meeting; unfinished business. At 4.30 p.m. a meeting of council will be held, and at 8 p.m. the annual dinner will take place at the Royal Alexandra Hotel.

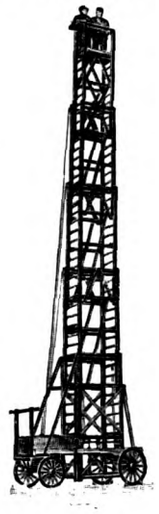
On Saturday, August 27, the members will inspect the Garson Quarries. A special train will be provided for this visit. The Winnipeg Builders' Exchange have also invited the members to be their guests in a visit to St. Andrew's Locks.

Notice of motion has been given by one of the members of the Institute that the council be given power to obtain amendments to the charter of the Royal Architectural Institute of Canada, and to take the other steps necessary to alter the constitution of the Royal Architectural Institute, to comply with the request in the joint resolution of all the official provincial associations throughout Canada, to form the R.A.I.C. into a federation of official Canadian architectural bodies. Among the principal amendments will be the changing of the name of the "Royal Architectural Institute of Canada" to the "Royal Institute of Canadian Architects," and providing a class of membership for those members of the Royal Architectural Institute who are not members of a provincial association, such as, for instance, "non-registered members."

FIRE-FIGHTING.

The subject of "Fire-fighting" is large, and it may be dealt with in several aspects, each of which might well absorb the application of a life-time. Fortunately our manufacturing firms do more or less specialise in the production of fire-resisting or fire-fighting appliances. Thus one will concentrate on one or other form of construction, another on hose, a third on alarms, and so on. In this single-minded arrangement there is a likelihood of the greatest possible success. Messrs. J. H. Heathman & Co., for instance, have built up in the course of years a high reputation as makers of escapes, engines and extinguishing apparatus. We here illustrate two of their ladders. It often happens that, although a powerful stream of water is available, its effect when driven upward at a window or roof is nullified by the fact that it is at such an angle that it is impossible for the water to go far on the roof or into the room. The adoption





of the Heathman's telescopic ladder tower, however (as here illustrated), enables a man to get upon a level with the window or roof to drive the water stream forcibly where desired; he can also see the heart of the fire and search out the point of danger. Another Heathman appliance is the tower here illustrated. It is of strong construction, adjustable at various heights mounted upon rubber-tyred wheels, with drag handle for easy transport; it turns over to pass archways and enter the storage shed, while it is available for use for window and gutter cleaners, painters, decorators, tree pruners, fruit picking and other estate requirements. The Countess of Suffolk, at Malmesbury, Sir George Faudel Phillips, at Ball's Park, the Marquis of Ailsa and the Earl of Onslow have adopted similar ladder towers. It often happens that if a bucket of water and a ladder were immediately available on the discovery of a fire the flames could be extinguished at once. This is exemplified by the report of the fire which recently broke out in the roof of Stringer Bros.' warehouse at Albion, West Bromwich, when the prompt application of two of Heathman's hand fire grenades enabled the caretaker to snuff out the flames and stop the danger.

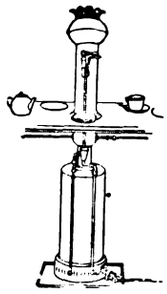
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TRADE NOTES.

The directors of John Oakey & Sons, Ltd., have declared an interim dividend at the rate of 10 per cent. per annum on the ordinary shares for the six months ending June 30, payable on September 1.

Messrs. Wm. Potts & Sons, clock manufacturers, Guildford Street, Leeds, and Newcastle-on-Tyne, are now making a new illuminated turret striking clock and bell for Mr. J. R. Renwick, Whitewall, Malton, Yorks., also thoroughly restoring the clock and chimes at Prestwich Asylum, Manchester, for the county authorities. Messrs. Wm. Potts & Sons are also making a large clock for Sir Tatton Sykes, Bart., Sledmere, East Yorks., and another large clock for Messrs. Knight & Forster, printers' lithographers and bookbinders, Leeds. A clock erected by them at the Marsden Mechanics' Institute, Huddersfield, was recently set in motion.

Messrs. Jackson Boilers, Ltd., are bringing out a new Cafe Fountain Boiler for use in restaurants, coffee-houses and refreshment rooms, which marks a substantial advance on previous types. It will deliver 2 pints of boiling water a minute, or 120 an hour. This is as much as a steam pressure



boiler at 18*l*. will do, whereas the "Jackson" only costs 10*l*. It can be adapted for hard or soft water. Any intending customer who wishes can have the use of a boiler for a month at the maker's risk. If, after it has been fixed according to the printed instructions, it does not do all that is claimed for it, it will be taken back at the maker's expense.

VARIETIES.

Mr. George C. Trewey, of Hampstead, formerly engineer-in-chief to the Gas Light and Coke Co., has left estate of the value of 120,118*l*.

The contract for the erection of the main buildings at Whalley Asylum has been let, it is said, to Messrs. R. Neill & Sons for the sum of 355,846*l*., subject to the approval of the Home Secretary, and the sanction of the Local Government Board being obtained to the borrowing of the money. The tender was the lowest of the fifteen sent in.

The promoters of the proposed Doncaster Trades and Friendly Societies' Institute (Limited) have appointed eight directors to carry out the preliminary arrangements. A site has been purchased on the North Bridge Road from the Doncaster Corporation, and the estimated cost of the enterprise is 6,500*l*. Plans of the new premises have been prepared by Mr. Masters.

Raith Rovers' Football Club, Ltd., last week submitted plans in Kirkcaldy Dean of Guild Court for a temporary extension of the present grand-stand in Stark's Park. The extended stand will provide accommodation for 600 extra spectators. The club has meantime departed from the erection of the proposed stand the plans of which passed the Dean of Guild Court some time ago, and which was estimated to cost fully 2,000*l*. The temporary plan was passed, and the work will be proceeded with at once.

Mr. A. A. Hudson, barrister, who was appointed by the Board of Trade to inquire into and arbitrate upon the painters' dispute in the Leigh district, which led to the painters going out on strike sixteen weeks ago to resist a reduction in wages of from 9*d*. to 8½*d*. per hour, has decided that the men shall receive 9*d*. per hour, that the hours of work shall be from 6.30 A.M. to 5.30 P.M., that further disputes shall be submitted to him, and that men taken on during the dispute by the employers shall be retained. About seventy or eighty men have been affected, and work has now been resumed.

The King, through Sir Arthur Bigge, has informed the Homeland Association that he will be glad to continue to receive their publications, thereby maintaining the interest in the Association shown for several years by the late King Edward. The special work of the Homeland Association is the preparation of a topographical survey of our own country and the encouragement of touring in the United Kingdom. The result is published in the series of Homeland Handbooks and Homeland Reference Books. Descriptions of the surroundings of St. Ives, Cornwall, and Bideford, North Devon, are among the latest publications.

It is reported that large iron and steel works are to be established at Barry on land the property of Lord Ashby St. Ledgers. It is stated that the steel works will be first established, occupying about 11½ acres of the land, while tin works, adjoining, will occupy about eight acres. Land will be reserved at the western end for other works of a similar character. The undertaking will have a capital of a million and a half sterling, and will probably give employment to about 500 men. The promoters are London gentlemen, the chairman being Mr. Mills, of Messrs. Glyn, Mills & Co., London. Another concern proposed to be started at Barry is one for the manufacture of steel rails, and this will have a capital of about 500,000*l*.

It is stated in a report by the American Consul at Catania that an English syndicate has made a proposal to the Italian Government to rebuild the Government properties in the Messina district, destroyed by earthquake in December 1908. It seems the syndicate is ready to undertake the construction of the port (piers, breakwater, ferry, slips, &c.), military barracks, university, court building, gaol, post office, governor's offices and residence, city hall, sewerage, drainage, &c., all of which are to be completed within five years' time. A London banking firm is willing to advance the Government 23,000,000*l*. at 3 per cent. per annum to carry out the work. As far as can be learned, the matter has not yet taken the form of a definite resolution before the Italian Chamber of Deputies.

A Local Government Board Inquiry has been held by Mr. H. A. Reed, M.Inst.C.E., into an application by the Doncaster Rural District Council for sanction to a scheme of main sewerage and sewage disposal for Adwick-le-Street and property near the station, which also includes the disposal of property at Woodlands Model Village, and the village now in course of erection at Scunthorpe. It is proposed to convey the sewage for a portion of the district to an underground pumping station, where storage tanks will be provided and the sewage pumped to the Woodlands sewage disposal works automatically by electric motors driving centrifugal pumps. The other portions will gravitate to the works. The sewage, after passing through screening and detritus tanks, will be dealt with in liquefying tanks, followed by double filtration through continuous filters, the final effluent discharging into humus tanks and thence into the mill dyke. The population to be dealt with at the works will be about 12,000. The scheme has been designed by Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne.

The Executive Council of the Scottish History Exhibition, which is to be held in Glasgow, have had to alter the plans somewhat as a consequence of the recent disastrous fire in the Brussels Exhibition. It had, for instance, been the intention to have a broken frontage of antique Scottish architecture round the building which is to house the historical exhibits. But as this would necessitate the inclusion of booths, and in view of the danger that might arise from fire it was decided to depart from that scheme and to have a frontage in the style of that of Falkland Palace. The most careful precautions will be taken against fire risks. They include the doing away with artificial light and artificial means of heating in the Jeffrey Library, which is to be utilised in connection with the section during the Exhibition. The present installation will be disconnected, and the buildings will be closed at dusk each day. The plans for the fine art buildings have now been completed, and estimates for the structure are being invited. The buildings will be specially fireproof throughout. They will consist of brick and stone, with concrete floors and iron roofs, while there will be an asbestos lining along the walls.

The Governors of Hutchesons' Educational Trust held a meeting on the 19th inst. in the Hutchesons' Building, Ingram Street, Glasgow. Regarding the minutes of the special committee on a proposed girls' school, to be erected in Kingarth Street, the Chairman said a letter had been received from the Glasgow Building Trades Employers' Council asking that the work should be let in separate contracts. As the school was required urgently, the special committee had decided that the whole thing should go as one contract. With regard to the plans, six sets had been submitted and examined, and the committee had elected in favour of that labelled "D." The architects' estimated cost was 19,745*l*. Instructions had been given that 15*l*. be paid to the unsuccessful competitors. The minutes having been adopted, the chairman opened the envelopes containing the names of the competing architects, when it was learned that the successful firm was Messrs. Thomson & Sandilands, Glasgow. In the report prepared for the Governors, the cost of the buildings to be erected by Messrs. Thomson & Sandilands is estimated at 20,367*l*.

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BICYCLING IN BEECHY BUCKS.

There seems no reason to challenge the assertion that Buckinghamshire derives its name from "boc" which is the Saxon name for the beech tree. Extensive forests, chiefly made up of these trees, at one time covered a considerable part of it. The



QUAKER MEETING-HOUSE AT JORDANS.



MILTON'S COTTAGE, CHALFONT ST. GILES

county is now a charming melange of woods, rivers, hills, pasture and arable land, with interesting towns and villages dotted about. It is a district eminently suited for the cyclist and the pedestrian who wishes to take things quietly. For







their use a novel booklet has just been published under the auspices of the Great Central Railway Company. It is called "Cycling Spins in Beechy Bucks" (London: R. T. Lang, Ltd.), and may be purchased for 2*d*. The object of this



STOKE POGES CHURCHYARD

booklet is apparently to afford such a guide that even the most perverse of travellers would find it impossible to go astray. The author, Mr. T. W. D. Smith (also author of "Strolls in Beechy Bucks" and "America's Motherland"),

in the unspoilt country. When he has arrived at the starting point the traveller will find that the guide-book shepherds him along almost every inch of the road, and that at each perplexing corner or meeting of cross roads the right direction is indicated in a circular photograph, by an arrow. After each spin the author has introduced a pithy account of places of interest en route—a few of these are here illustrated. They will serve to suggest what a delectable county is Beechy Bucks



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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

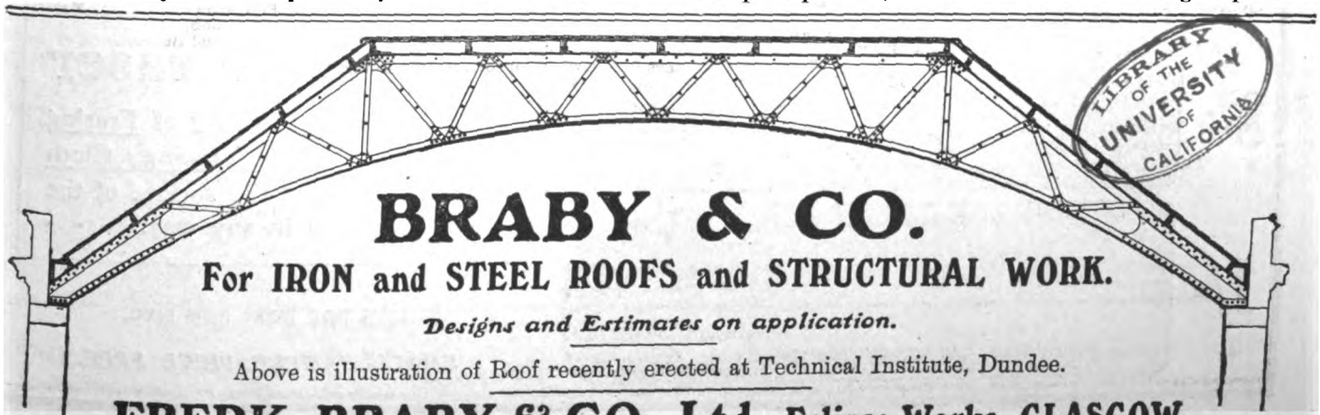
ANTWERP.—Oct. 1.—An international competition is being arranged for a scheme for the laying out of the land surrounding Antwerp, which will shortly be available by the demolition of the encircling fortifications. Premiums of 1,000*l.*, 400*l.*, and 200*l.* are offered. Copies of the conditions, &c., may be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C., or, on payment of 100 francs from the "Commission d'études de l'aménagement de l'agglomération anversoise," 57 Rue du Jardin des Arbalétriers, Antwerp.

BELFAST.—Sept. 15.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of *bona-fide* design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

FOLKESTONE.—Sept. 10.—Designs are invited for a secondary school to accommodate 150 boys. Deposit 2*l.* 2*s.* Mr. A. F. Kidson, town clerk, Folkestone.

IRELAND.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

IRELAND.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital



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and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

MANCHESTER.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

RUISLIP.—The Directors of Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

SHERINGHAM.—Sept. 5.—The Urban District Council invite designs for proposed new Council offices. Apply, enclosing a stamped and addressed envelope, to Mr. Edgar C. Rolfe, clerk, Church Street Chambers, Sheringham, Norfolk.

WALES.—Sept. 19.—The town hall committee invite competitive designs, &c., for the proposed alterations and additions (not exceeding in cost 3,000*l.*) to the town hall and market hall, Maesteg. Conditions, with a plan of site and sections at ground level, may be obtained from Mr. Samuel J. Harpur, engineer and surveyor, Town Hall, Maesteg. Two premiums are offered, namely, 25 guineas and 10 guineas, as first and second respectively. The committee do not bind themselves to award the premiums, and they do not intend to engage the authors of the designs for which premiums may be awarded to carry out or supervise the work.

WALES.—Oct. 1.—The Town Council of the borough of Denbigh invite competitive plans and designs of a public hall, markets, municipal buildings, &c., which it is proposed to erect at a cost not to exceed 10,000*l.* Three premiums are offered, viz. 75*l.*, 30*l.* and 20*l.*, as first, second and third respectively. Send 1*l.* 1*s.* deposit for particulars, &c., Mr. J. Parry Jones, town clerk, Denbigh.

CONTRACTS OPEN.

ANDOVER.—Sept. 7.—For erection of a post office at Tidworth Camp, Andover, for the Commissioners of H.M. Works and Public Buildings. Mr. E. Cropper, 22 Carlisle Place, S.W., or the Postmaster, Tidworth Camp Post Office.

BARNSLEY.—Sept. 5.—For erection of a tea-house or pavilion at the Locke Park. Mr. J. Henry Taylor, M.I.C.E., borough surveyor, Manor House Offices, Barnsley.

BLACKBURN.—Sept. 6.—For the labour required in the erection of a dry rubble wall at Warcock Green, and also for supply and delivery of stone for same, for the small holdings and allotments committee (the stone may be quarried on the farm). Mr. William Stubbs, A.M.I.C.E., borough engineer, Municipal Offices, Blackburn.

BRADFORD.—Sept. 8.—For the erection of farm buildings at Simpson Green, Idle. The Estate Agent's Office, Esholt Hall.

BROUGHTON.—Sept. 5.—For the erection of a small holding, dwelling and outbuildings, at Broughton, near Chester. Mr. Sam Evans, F.S.I., county surveyor, County Offices, Mold.

BURY.—Sept. 6.—For the enlargement of the Bury (Lancs.) Post Office. Deposit 1*l.* 1*s.* The Postmaster, Bury Post Office; or H.M. Office of Works, Storey's Gate, London, S.W.

CAMBRIDGE.—Sept. 14.—For erection of a cottage in Albion Row. The Borough Surveyor, Guildhall, Cambridge.

CARLISLE.—Sept. 5.—For the supply and erection of cold storage and conveying plant, for the electricity department. Deposit 1*l.* Mr. S. T. Allen, city electrical engineer, Electricity Works, James Street, Carlisle.

CHARNEY-BASSETT.—Sept. 15.—For erection of small holding farm buildings and alterations to existing farm buildings. Deposit 1*l.* 1*s.* The County Land Steward's Office, Assize Courts, Reading.

COSHAM.—Sept. 19.—For alterations and new heating apparatus to cells at the Cosham police station, Hants. Deposit 1*l.* 1*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

ECCLESTON.—Sept. 24.—For erection of an elementary school at Eccleston, near St. Helens, to accommodate 170 scholars. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

EDINBURGH.—Sept. 6.—For the erection of a cottage near Broomlee Station, for the Edinburgh and District Water Trustees. The Works Department, 12 St. Giles Street, Edinburgh.

FRITHVILLE.—Sept. 15.—For alterations to the Council school at Frithville, in the county of Lincoln. Send 1*l.* 1*s.* deposit by Sept. 5. Messrs. Scorer & Gamble, architects, Bank Street Chambers, Lincoln.

FROME.—Sept. 5.—For the construction of a brick culvert 50 yards in length at Beckington. Mr. J. Ace Beynon, surveyor, Nunney Road, Frome.

HALLATROW.—Sept. 8.—For erection of the Station Hotel and premises at Hallatrow, near Bristol. The Welton Breweries Co., Ltd., Midsomer Norton.

HANDSWORTH.—Sept. 9.—For the following works, viz.:—Handsworth: Woodhouse Council school, alterations to cloak room (builder, joiner and plumber), for the West Riding education committee. The Education Architect, County Hall, Wakefield.

HEBDEN BRIDGE (YORKS.).—Sept. 10.—For the works required in the provision of a bathroom in the headmaster's house of the Cragg Vale Council School. The Headmaster at the school, or Mr. Richd. H. Whitworth, divisional clerk, Education Offices, Sowerby Bridge.

HINDLEY.—Sept. 12.—For erection of cart sheds in the stable yard, Cross Street. Deposit 1*l.* 1*s.* Mr. Oswald P. Abbott, surveyor, Council Offices, Hindley.

HURST.—Sept. 15.—For erection of small holding farm buildings at Church Farm. The County Land Steward's Office, Assize Courts, Reading.

IRELAND.—Sept. 14.—For erection of one single and five pairs of labourers' cottages, for the Rathdown No. 2 Rural District Council. Mr. Patrick Cunniam, clerk to the Rural District Council, Loughlinstown.

IRVINESTOWN.—Sept. 6.—For the erection of thirty-six single cottages for labourers, and for fencing thirty-six plots to same, for the Rural District Council. Mr. Thomas Aiken, clerk of the Rural District Council, the Boardroom, Irvinestown.

LEAMINGTON.—Sept. 3.—For erection of a greenhouse in Jephson Gardens. The Borough Engineer, Town Hall, Leamington.

LEGSBY.—Sept. 15.—For erection of a Council elementary school at Legsby, for the Lindsey County Council education committee. Send 1*l.* 1*s.* deposit by Sept. 5. Messrs. Scorer & Gamble, architects, Bank Street Chambers, Lincoln.

LONDON.—Sept. 6.—For erection of the Patent Office extension, Furnival Street. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

LONDON.—Sept. 6.—For additions and alterations to stables at Paddington for the Great Western Railway. The New Works Engineer, Paddington Station, London, W.

LONDON.—Sept. 6.—The managers of the Poplar and Stepney sick asylum district are prepared to receive tenders for proposed nurses' class room and addition to drug stores, &c., at their District Sick Asylum, Devons Road, Bromley, E. Deposit 5*l.* Messrs. J. & W. Clarkson, architects, 136 High Street, Poplar, E.

LONDON.—Sept. 6.—For the demolition of Nos. 140, 142 and 144 Lewisham High Road, S.E. Borough Surveyor, Town Hall, New Cross Road, S.E.

LONDON.—Sept. 7.—For removing two iron buildings, offices, coal store, &c., one from Sandhurst Road, Catford, S.E., and the other from the Earlsfield Council School, Tran-

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mere Road, Wandsworth, S.W., and re-erecting them on a site in Magdalen Road, Earlsfield, S.W., including new foundations, drainage, &c., for the London County Council. The Architect's Department, 19 Charing Cross Road, W.C.

LONDON.—Sept. 15.—For the erection of a green-house and potting-shed at Wandsworth Cemetery, Magdalen Road. The Borough Engineer's Office, 215 Balham High Road, S.W.

LONDON.—Sept. 20.—For alterations and additions to the laundry at Brentford Workhouse, Isleworth, W. Send 2*l.* 2*s.* to Mr. W. Stephens, clerk, Union Offices, Isleworth, W. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

MANCHESTER.—Sept. 10.—For the erection of the Elysian Street Municipal school, Openshaw, and the Ravensbury Street Municipal school, Clayton. Deposit 2*l.* 2*s.* at the Education Offices, Deansgate, Manchester.

MARGATE.—Sept. 6.—For the construction of a wash-house and w.c. at the Corporation yard, Victoria Road. Borough Surveyor, 13 Grosvenor Place, Margate.

MARKET HARBOROUGH.—Sept. 14.—For the erection of a police court, superintendent's house, stables, and alterations to existing buildings. Deposit 3*l.* 3*s.* Mr. S. Perkins Pick, F.R.I.B.A., county architect, 6 Millstone Lane, Leicester.

MINSKIP.—Sept. 16.—For proposed farmstead at Minskip, near Boroughbridge. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

MORECAMBE.—Sept. 5.—For erection of a new art and technical school. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

NORTH SHIELDS.—Sept. 6.—For alterations to and constructing conveniences upon the premises, 15 and 16 Borough Road. Deposit 1*l.* 1*s.* Mr. John F. Smillie, borough surveyor, Tynemouth.

NOTTINGHAM.—Sept. 5.—For the erection and completion of sliding or, alternatively, revolving shutters at the men's sanatorium, Bagthorpe Workhouse. Mr. Arthur Marshall, A.R.I.B.A., architect, King Street, Nottingham.

PENGE.—Sept. 17.—For additions and alterations to their offices, Town Hall, Anerley Road, S.E., for the Penge Urban District Council. Send at once names and addresses, with a deposit of 2*l.* 2*s.*, to Mr. H. W. Longdin, architect, Town Hall, Anerley.

PONTEFRACT.—Sept. 10.—For erection and completion of twenty-eight model dwellings, Skinner Lane. Mr. James Heseltine, architect and surveyor, Old Castle Drawing Office, Pontefract.

PORTSMOUTH.—Sept. 5.—For works to be done and materials to be supplied in constructing new steps on the south side of the eastern approach to Jessie Road Bridge, Southsea. The Borough Engineer's Office, Town Hall, Portsmouth.

PORTSMOUTH.—Sept. 12.—For constructing, supplying and maintaining in thorough repair for six calendar months from the completion of the whole thereof, the following works:—(1) A waiting room for visitors and bicycle store at the north-east entrance of the town hall, and (2) alterations and additions to the borough engineer's offices at the town hall. The Borough Engineer's Office, Town Hall, Portsmouth.

PUDSEY (YORKS.).—For erection of warping and beaming shed at Brick Mills. Messrs. Jowett Kendall & Sons, architects, South Parade, Pudsey, Yorks.

ROOKHOPE.—Sept. 10.—For the whole or any separate part of the several works required in erection and completion of proposed new branch business premises at Rookhope, Durham. Mr. W. B. Barron, architect, 3 West View, Blackhill, or Mr. E. Golightly, secretary, Co-operative Society, Ltd., Front Street, Stanhope.

ST. HELENS.—Sept. 13.—For building a small power house near to Windle Smithies, for the Rainford Gas Company, for the Gas Committee. The Gas Works Office, Warrington Old Road.

ST. HELENS.—Sept. 12.—For erection of a secondary school for boys in Cowley Hill Lane, St. Helens, Lancs. Deposit 1*l.* 1*s.* Mr. Frank S. Biram, architect, George Street, St. Helens.

SCOTLAND.—Sept. 6.—For the following works to be executed at Munnoch reservoir, Dalry, Ayrshire, for the Irvine and District Waterworks:—(1) For taking down existing wood paling and building about 780 yards of stone wall; (2) taking down existing wood paling and supplying and erecting about 970 yards of continuous iron bar fencing. Deposit 1*l.* each contract. Mr. Gilbert Christie, engineer, Central Offices, Kilwinning.

SCOTLAND.—Sept. 13.—For carrying out alterations and additions to Helensburgh Post Office, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Post Office, Helensburgh, or H.M. Office of Works, 3 Parliament Square, Edinburgh.

SCOTLAND.—Sept. 20.—For the mason, joiner, slater, plumber, and plasterer work of four new houses to be erected in Morebattle. Messrs. Main & Shanks, solicitors, Kelso.

SOUTHALL.—Oct. 4.—For the following, for the Southall Norwood Urban District Council, viz.:—(*a*) Boiler house; (*b*) hot-water heating; (*c*) hot-water supply at the sanatorium; and (*d*) paving works; and (*e*) channelling work. Mr. Reginald Brown, A.M.I.C.E., F.S.I., &c., engineer and surveyor, Public Offices, Southall, Middlesex.

SOUTHAMPTON.—Sept. 19.—For alterations and heating apparatus to cells at the Winchester county police station. Deposit 1*l.* 1*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

TEWKESBURY.—Sept. 16.—For alterations at the old buildings of the Tewkesbury Grammar School. Mr. H. A. Badham, secretary, Tewkesbury.

UPPERBY.—Sept. 13.—For the work required in erection of a new mixed school and for alterations and additions to infants' school, Upperby, Cumberland. Mr. J. Forster, M.S.A., architect, 13 Earl Street, Carlisle.

WAKEFIELD.—Sept. 14.—For new house and alterations to existing house and farm buildings at Bond Hill Ash Farm, Copmanthorpe, near York. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

WALES.—Sept. 5.—For erection of an infants' school at Darren View, Merthyr Tydfil, also for erection of a boys' school and a girls' school adjoining Thomastown Park (exclusive of the Domestic Subjects block, which will be subsequently tendered for). Deposit 2*l.* 2*s.* The Deputy Surveyor, Town Hall, Merthyr Tydfil.

WALES.—Sept. 6.—For the erection of forty-five houses, together with the construction of roads, sewers, surface water drains, &c., at Ynys-y-gored, Aberfan, for the Grove Building Club. Mr. T. Edmund Rees, architect and surveyor, The Walk, Merthyr Tydfil.

WALES.—Sept. 6.—For alterations and additions to the Independent Chapel, Llanrhaiadr-yn-Mochnant. Mr. E. Vaughan-Edmunds, architect and surveyor, Llanrhaiadr, Oswestry.

WALES.—Sept. 7.—For the following works, for the Glamorgan County Council, viz.:—(1) Alterations to the boys' department of Plasnewydd School, Maesteg; (2) improvements at Bedlinog School House; (3) additions to Bargoed Boys' Council School; (4) erection of a caretaker's cottage at Cowbridge County School; (5) improvements at Wern Council School, near Ystalyfera. The County Council Offices, Westgate Street, Cardiff.

WALES.—Sept. 9.—For erecting a public hall at Penygroes, Carmarthenshire. Mr. W. D. Jenkins, F.R.I.B.A., Llandilo.

WALES.—Sept. 10.—For the erection of a new police station at Nelson, Glamorgan. The County Police Station, Bargoed, and at the County Council Offices, Westgate Street, Cardiff.

WALES.—Sept. 12.—For the erection of thirty-one houses and the construction of the necessary roads at Cwmtillery, for the Abertillery Urban District Council. Deposit 1*l.* 1*s.* Mr. Lionel D. Lewis, engineer, King Street, Abertillery.

WALES.—Sept. 13.—For erecting a residence at Aberporth. Capt. J. Davies, Step, Aberporth, R.S.O., Cardiganshire.

WALES.—Sept. 22.—For erection of 240 houses and 10 shops on the Glyn Gwyn Estate at Bedwas, Mon., for the Tre Thomas Building Club. Mr. James T. Jenkins, architect and surveyor, Porth, Glamorgan.

WALES.—Sept. 24.—For the construction at Newport, Mon., of foundations and buildings for a new pumping and power station, near the new entrance now under construction for the Alexandra (Newport and South Wales) Docks and Railway Company. Send 5*l.* 5*s.* deposit by Sept. 7. Sir John Wolfe Barry & Partners, Dartmouth House, 2 Queen Anne's Gate, Westminster, S.W.

WALES.—Oct. 1.—For building a school (accommodation 500) at Hendy, Pontardulais, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., County Architect, County Education Offices, Carmarthen.

WALNEY.—Sept. 6.—For erection of additional classrooms and other alterations at the temporary school, Ocean Road, Walney, Barrow-in-Furness. The Borough Engineer's Office, Barrow-in-Furness.

WELLINGTON.—Sept. 24.—For erection of a secondary school to accommodate 200 pupils at Wellington, Salop. Messrs. Shayler, Swan & Ridge, joint architects, 16 Pride

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Hill, Shrewsbury. Send 3*l.* 3*s.* deposit to Mr. W. Windsor, quantity surveyor, 37 Brown Street, Manchester.

WEST HAM.—Sept. 19.—For erection of the Gainsborough Road school, Canning Town, for 1,500 children, for the West Ham Education Committee. Make written application and send 5*l.* deposit by September 3 to Mr. William Jacques, A.R.I.B.A., architect to the Education Committee, 2 Fen Court, Fenchurch Street, E.C.

WINDY NOOK.—Sept. 3.—For proposed stables at Windy Nook Industrial and Provident Society, Ltd. Mr. L. G. Ekins, architect, Co-operative Wholesale Society, Ltd., West Blandford Street, Newcastle-on-Tyne.

TENDERS.

BISHOP AUCKLAND.

For alterations to the old infirmary at the Auckland Workhouse. Mr. F. H. LIVESAY, architect, Bishop Auckland.

Sowerby	£560 14 0
Earnshaw	509 15 7
Bell	497 18 6
HOPE, Coundon (*accepted*)	486 10 2

GEDLING.

For church schools enlargement. Mr. R. WHITBREAD, architect and surveyor, Carlton, Nottingham.

Appleby	£1,128 8 0
Cuthbert	1,042 10 0
HARPER, Carlton (*accepted*)	1,007 2 6

GRAYS (ESSEX).

For the erection of electrical theatre for Messrs. Fredericks Electrical Theatre Co., Ltd. Mr. J. M. H. GLADWELL, architect, Essex House, High Street, Stratford, E. Quantities by Mr. W. T. W. CASTELL, 4 Verulam Buildings, Gray's Inn, W.C.

Hosking	£4,498 0 0
Symes	4,397 0 0
Carter	4,177 0 0
Brown	3,137 0 0
Jerram	3,095 0 0

GRIMSBY.

For the erection of a pavilion at the Bowling Green, Brighowgate. Mr. HERBERT C. SCAPING, architect, Grimsby.

H. & E. Smith	£429 0 0
Johnson	391 15 6
Emerson Bros.	382 17 0
Hewins & Goodhand	379 17 9
Towle Bros.	376 0 0
Sime	372 14 5
Marrows	370 15 10
THOMPSON & SON, Grimsby (*accepted*)	352 0 0

HAZEL GROVE.

For erection of a public elementary Council school in Chapel Street, Hazel Grove, near Stockport, to accommodate 800 children, with housewifery, laundry, and cookery centres and caretaker's quarters. Mr. C. T. ADSHEAD, architect, Manchester.

Reinforced Concrete Engineering Co.	£10,865 0 0
Lane	10,800 0 0
Young, Tinker & Young	10,773 0 0
Smethurst	10,773 0 0
Smith Bros.	10,692 0 0
Neill & Sons	10,642 0 0
Eadie & Co.	10,600 0 0
Wilson & Toft	10,583 0 0
Vernon & Smith	10,470 0 0
Briggs	10,467 0 0
Gerrard & Sons	10,283 0 0
Meadows & Sons	10,197 0 0
Beattie	10,080 0 0
Clayton Bros.	10,070 0 0

HINCKLEY.

For additions to "Forest View." Mr. W. T. GREWCOCK, A.R.I.B.A., architect, Leicester and Hinckley.

Bradshaw Bros.	£1,319 0 0
Jeffcote	1,282 0 0
Herbert & Sons	1,216 0 0
Scurr, Jowett & Co.	1,212 0 0
Hall & Son	1,198 15 0
BENTLEY & Co. (*accepted*)	1,171 0 0

LINCOLN.

For erection of children's home on Longheys Road, for the Guardians.

Horton	£1,329 1 1
Elms	1,287 2 3
FAIRCHILD, Lincoln (*accepted*)	1,164 5 0

LONDON.

For extension of Police Candidates' Section House, Peal House, Regency Street. Mr. J. DIXON BUTLER, F.R.I.B.A., architect and surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Foster & Dicksee	£22,803 0 0
Dorey & Co.	21,937 0 0
King & Sons	21,719 0 0
Hall, Beddall & Co.	21,520 0 0
Carmichael	21,361 0 0
Adamson & Sons	21,287 0 0
Trollope, Son & Colls	21,270 0 0
Holland & Hannen	21,261 0 0
Ashby & Horner	21,223 0 0
F. & H. Higgs	21,178 0 0
Holloway Bros.	21,000 0 0
Higgs & Hill	20,894 0 0
Wallis & Sons	20,468 0 0
Jarvis & Sons	20,440 0 0
Treasure & Sons	20,420 0 0
Godson & Sons	20,376 0 0
Killby & Gayford	20,333 0 0
Williams	20,264 0 0
Prestige & Co.	20,256 0 0
Sabey & Son	20,194 0 0
Patman & Fotheringham	20,193 0 0
Lovatt	19,991 0 0
Mowlem & Co.	19,980 0 0
Grover & Sons	19,888 0 0
Holliday & Greenwood	19,789 0 0

For alterations and additions at 119 Seven Sisters Road, Holloway, N. Messrs. COLEMAN & HOLMES, architects, 5 Rosemont Terrace, North Finchley, N.

Kirby	£595 0 0
Compton Bros.	549 10 0
Parsons & Son	520 0 0
Stewart	518 10 0
Slough	515 0 0
G. E. Brown	498 15 0
Pryke	498 10 0
Thomas	490 0 0
H. Brown	463 0 0
BATE BROS., Hornsey Rise (*accepted*)	437 0 0
Architects' estimate	450 0 0

MACCLESFIELD.

For erection of a public elementary school, play sheds, boundary fences, and other works in Byron Street. Messrs. WHITTAKER & BRADBURN, architects, 19 King Edward Street, Macclesfield.

Wellerman Bros.	£12,417 0 0
Gerrard & Son	12,276 0 0
Briggs	12,830 0 0
Neill & Son	12,696 0 0
Matthews	12,652 0 0
Brown & Son	11,382 0 0
Simpson & Son	11,289 12 0
Gorton & Wilson	12,150 0 0
Clayton Bros.	12,860 0 0
Huxley	11,900 0 0
ROYLANCE & Co., Macclesfield (*accepted*)	11,530 0 0

ORSETT.

For installation of heating and laundry appliances at Orsett Union Workhouse, Essex. Mr. CHRISTOPHER M. SHINER, A.R.I.B.A., architect, 10 Duke Street, Adelphi, W.C., and Grays, Essex.

Manlove, Alliott & Fry	£1,480 0 0
Wenham & Waters	1,420 0 0
Tullis	1,203 0 0
Barford & Perkins	1,157 0 0
Bradford	1,073 0 0

For installation of gas at Orsett Union Workhouse, Essex. Mr. CHRISTOPHER M. SHINER, A.R.I.B.A., architect.

Loco Gas	£155 4 6
Non-Explosive	131 15 0
Machine Gas	125 0 0
Eos Petrol Gas Co.	94 0 0
Centenary Gas Co.	68 10 0

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SOUTHAMPTON.

For additions to "Bitterne Grove," Southampton. Mr. WILLIAM BURROUGH HILL, F.S.I., architect, Southampton.

Fussell	£2,898 19 6
Wright & Son	2,890 0 0
Wilkins	2,846 0 0
Jupe	2,729 0 0
Stevens & Co.	2,685 0 0
Playfair & Toole	2,684 0 0
Cawte	2,601 0 0
JENKINS & SONS, Southampton (*accepted*)	2,588 0 0

STACKSTEADS.

For the erection of the Catholic Club in Huttock End Lane, Stacksteads. Mr. SAMUEL T. WILLIAMS, architect, Bankside Lane, Bacup.

Accepted tenders.

Dyer, Shawforth, near Rochdale, mason	£600 0 0
J. & J. Ormerod, Stacksteads, joiner	373 0 0
Wood & Son, Bacup, heating apparatus	76 0 0
Whittles, Stacksteads, plumber and glazier	73 0 0
Noon, Bacup, plasterer and painter	68 0 0
Duckett & Son, Burnley, sanitary fittings	64 2 6
Whitehead, Stacksteads, slater	55 14 4
Morton & Co., Liverpool, steel girders and principals	33 12 6

SWANSCOMBE.

For the erection of the Knockhall Council School, Swanscombe, for the Kent education committee. Mr. WILFRID H. ROBINSON, M.S.A., architect to the committee, Caxton House, Westminster, S.W.

The Fireproof Partition and Spandril Co.	£3,700 0 0
Milton Bros.	3,348 0 0
Johnson & Co.	3,329 0 0
Blay	3,297 0 0
Howard	3,293 14 4
Paul	3,272 0 0
H. & C. Taylor	3,267 0 0
Tong	3,183 0 0
Ellingham	3,143 0 0
Lingham	3,137 0 0
Flint, Nash & Co.	3,137 0 0
Wallis & Sons	3,129 0 0
Nightingale	3,068 0 0
West Bros.	2,999 0 0
Archer & Son	2,990 0 0
Baker & Son	2,987 0 0
Skinner	2,984 0 0
Gates & Sons	2,971 0 0
Friday & Ling	2,940 0 0
Bowes, Chalkwell Road, Milton Regis, Kent (*recommended*)	2,890 0 0

WALES (YORKS.).

For laying 5,400 yards of 12-inch, 9-inch, and 6-inch glazed earthenware and cast-iron pipe sewers, the construction of manholes, tanks, filters, engine house and sump, &c., and other appurtenant works, for the villages of Wales and Wales Bar, for the Kiveton Park Rural District Council. Messrs. BERRINGTON, SON & WATNEY, engineers, Wolverhampton, and 28 Victoria Street, Westminster, S.W.

Smart	£12,933 1 6
Braithwaite & Co.	11,198 6 8
Palmer	10,942 5 10
Nadin	10,439 16 0
Lane Bros.	10,308 14 0
Jowett Bros.	10,100 11 7
Moss & Sons	10,058 0 0
Waring & Sons	9,999 0 0
Graham & Sons	9,951 0 0
Ward & Tetley	9,958 16 0
Deakin	9,928 15 3
Owens	9,859 2 3
Brigg	9,602 12 6
Wright & Co.	9,502 18 0
Bower Bros.	9,398 0 0
Winser	9,333 2 2
Crawford	8,995 0 0
BOSWELL, Wolverhampton (*accepted*)	8,700 0 0

WALES.

For erection of a branch bank and manager's residence at Newcastle-Emlyn, for the Metropolitan Bank of England and Wales, Ltd. Mr. C. RUSSELL PEACOCK, architect, Swansea.

Stephens, Bastow & Co.	£1,688 0 0
Mercer	1,638 3 11
Davies & Sons	1,530 0 0
Bloxham	1,476 0 0
THOMAS & LEWIS, Newcastle-Emlyn (*provisionally accepted*)	1,435 7 3

For the construction of an underground public lavatory on the West Shore, Llandudno, opposite Gloddaeth Avenue and West Parade, for the Llandudno Urban District Council.

Owen	£1,087 16 0
Thorp & Sons	955 10 0
HUGHES & SON, Llandudno (*accepted*)	929 1 0

WATFORD.

For erecting a grammar school. Messrs. RUSSELL & COOPER, F.R.I.B.A., 11 Gray's Inn Square, W.C. Quantities by Mr. GEORGE A. WEBSTER, 12 Gray's Inn Square, W.C.

		Extra for substitution of glazed tiles in place of cement dados.	Extra for substitution of glazed brick in place of cement dados.
J. & M. Patrick	£16,188	£471	£481
Longley & Co.	15,989	530	428
Perry & Co. (Bow)	15,747	513	630
Paul	15,745	492	554
Moss & Sons	15,675	598	540
Redhouse & Son	15,488	497	523
Fryer & Co.	15,391	442	490
E. Lawrence & Sons	15,350	485	381
King & Sons	15,300	583	525
Fitch & Cox	15,286	430	376
Nicholson & Sons (Leeds)	15,000	550	650
Bloxham	14,996	685	770
Willcock & Co.	14,975	470	598
Martin	14,940	597	538
Rowland Bros.	14,929	476	350
Miskin & Sons	14,870	700	600
Sabey & Son	14,850	530	548
Appleby & Son	14,838	576	476
Allan & Son	14,832	446	552
Lovatt	14,800	464	530
G. & J. Waterman	14,755	435	529
Arnold & Son	14,700	507	498
Willmott & Sons	14,693	479	423
Henson & Son	14,600	529	550
W. Lawrence & Son	14,584	524	560
Honour & Son	14,532	481	566
Gathercole Bros.	14,500	480	500
Gibson & Sons	14,485	443	236
Clark Bros.	14,444	400	516
W. & D. Wilkins	14,197	556	469
Flint, Nash & Co.	14,093	460	420
Brown & Son	13,995	459	513
Brightman & Son	13,899	490	521
Hacksley Bros.	13,885	379	661
ROPER, Ipswich (*conditionally accepted*)	13,598	495	525

THE Southend Corporation has decided to build a new pier at a cost of 10,000*l*.

THE Bray Amusements Committee, Ireland, have decided to ascertain the probable cost of the erection of a pavilion at Bray, to find a suitable site, and make contingent arrangements.

MR. FRED BATH, F.R.I.B.A., F.S.I., of Salisbury, has prepared plans for a new cinematograph theatre to be erected in Castle Street, Salisbury, to which it will have a 48-feet frontage. The site will be cleared of its present premises immediately the City Council have passed the scheme.

THE church built by the dispossessed section of the Free Church congregation of Rosskeen, Wester Ross, N.B., has been formally opened. The building is in the Gothic style of architecture, from plans prepared by Messrs. Maitland, architects, Tain. The church accommodates 400 persons, and cost about 1,300*l*.

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VARIETIES.

THE Coventry City Council at their meeting on August 30 passed plans for a large number of houses and extensions to dwellings and some public buildings.

THE Bolton Electricity Committee have accepted the tender of Messrs. Newton, Chambers & Co. for a feed water tank for the works; also a tender for the necessary brickwork from Messrs. James Bradbury & Sons.

THE Sittingbourne and Milton joint hospital board have decided to erect a sanatorium for the treatment of consumptive patients. The board have pledged themselves that the cost shall not exceed a rate of 1*d.* in the pound.

MR. W. A. LEWIS, A.R.I.B.A., 11 and 12 Finsbury Square, E.C., has prepared plans for the erection of an electric theatre in Week Street, Maidstone, at an estimated cost of 2,785*l.* A company has been formed to carry out the project.

MESSRS. PATMAN & FOTHERINGHAM, builders and contractors, 100 & 102 Theobald's Road, W.C., have been successful in obtaining the contract for the erection of offices at Nos. 362-364 Gray's Inn Road, W.C., for Messrs. Willing & Co., Ltd., under Messrs. Hart & Waterhouse, architects.

MR. LEIPER, R.S.A., has reported on the designs which have been submitted by various Glasgow artists for the completion of the decoration scheme of the banqueting hall of the Glasgow Municipal Buildings. The Decoration Committee of the Corporation on Monday visited the studios of the artists and inspected some of their finished work.

MESSRS. READ & WARING, civil engineers, London, have prepared a scheme for the provision of a water supply to Tweedmouth and Spittal, at a cost of 14,200*l.* The Berwick Town Council have been informed by the Local Government Board that they must take definite steps in the matter before September 3.

THE *Boletin* (Argentine Republic) of July 30 contains a decree, issued by the General Directorate of Architecture, approving the contract with Messrs. Zacarías Marioni y Hermano for the construction of a building for the National College of Buenos Aires. The cost of the work is estimated at 2,122,536 pesos currency (about 186,000*l.*).

THE Sunderland Education Committee on Tuesday agreed to recommend to the Town Council to erect a permanent day training college for teachers on a site of not less than twelve acres in Durham Road. The site will cost 7,800*l.*, the estimated cost of preparing the playing fields was 675*l.*, and the estimated cost of the buildings 13,500*l.*, a total of 21,975*l.* Of this total the Government grant, according to promise, would be 75 per cent., or 16,481*l.* in perpetuity, free of interest.

IT is officially stated that special provisions against any further outbreak of fire are to be made in the new British section at Brussels. An offer by Messrs. Mather & Platt to furnish the Salle des Fêtes free of charge with a complete installation of Grinnell automatic sprinklers has been accepted by the Exhibition's branch. Messrs. Merryweather & Sons, Ltd., will lend to the department one of their steam fire engines of the latest type. A staff of firemen will be in charge of the section.

IN describing trade conditions in South Africa, the American Consul-General there says that in the Transvaal there are building contracts in hand to the extent of between 2,000,000*l.* and 3,000,000*l.* for the erection of the various Government buildings for the Union Government at Pretoria, besides museums, schools, and colleges at the other cities in the Transvaal. In addition to these, there is to be a new tramway line at Pretoria, costing about 80,000*l.*, also the installation of a complete sewerage system costing 100,000*l.*

THE Edinburgh Dean of Guild Court last week granted warrant to the Church of Scotland Home Mission Committee to erect a church in Rosefield Place, Portobello. The building will consist of nave with side aisles, north and south transepts, choir and choir aisles. At the east end will be a hall, and between it and the church will be placed a session-room and vestries. The architect is Mr. G. Mackie Watson. At the same Court warrant was also granted to Mr. W. Birnie Rhind for the erection of a studio at Pitt Street, and another to Mr. David Waldie for a tenement at the corner of Roseburn Place and New Street.

FOR the man whose business takes him from London to Doncaster for the whole of the race week special arrangements have been made by the Great Central Railway Company enabling him not only to accomplish the journey in comfort, but at a very cheap fare. On Monday, September 5, a special luncheon car express will leave Marylebone at 1.15 P.M., return fares, first class 32*s.*, third class 16*s.* On Wednesday and Friday mornings the journey to Doncaster and back may be made for 34*s.* 6*d.* first class and 19*s.* third class, including table d'hôte luncheon on the outward journey and dinner on the return. To secure accommodation on the train early application should be made to Marylebone Station Booking Office.

NEGOTIATIONS are taking place with regard to the purchase of plots for building purposes on the Westfield Park Estate, Doncaster, which has been marked out in streets, and plans, so far as this portion of the area is concerned, approved by the Doncaster Corporation. The Balby-with-Hexthorpe Urban Council is also being asked to approve plans for that portion of the estate which is in their district. The scheme includes five parallel streets each 42 feet in width. It is proposed that the houses facing Balby Road shall have a frontage of 20 feet, with gardens in front. The remaining houses will have a frontage of about 15 or 16 feet, and a depth of 70 feet, allowing the erection of eight rooms, with bathroom and lavatory to each house. The scheme provides for the erection of 500 houses, accommodating over 2,500 people.

A LOCAL GOVERNMENT BOARD enquiry was held last week at Bolton-upon-Dearne, near Doncaster, into an application by the Urban Council for a loan of 9,475*l.* wherewith to erect 48 workmen's houses. The proposed houses are of four types. Eight of them, costing 225*l.* each and let at 6*s.* 6*d.* per week, will have three ground floor rooms, three bedrooms, and a bathroom; twelve more (180*l.* each and 6*s.* per week) will have one living-room, three bedrooms, and a bathroom; twenty more (160*l.* each) will have one living room, two bedrooms, and an attic bedroom; and the remaining eight (140*l.* each) will have the same accommodation but with the substitution of a pantry for a cellar. Each house will have an allotment of ground, and there will be plenty of open space around the buildings.

THE new and important colliery at Easington, Durham, will, in a month or so, it is expected, be in full swing. The sinking of the north pit has been completed, and good progress is being made with the sinking of the south pit. Building is proceeding rapidly. About 160 colliery houses of a good type have been finished and 120 others are in course of construction, but these numbers will be greatly augmented, as the colliery is to be of huge proportions. A temporary school building has just been erected for 210 children. When needed, the County Council will build a permanent school to accommodate, it is stated, 1,700 children. The Haswell Co-operative Society have built premises at the colliery and four cottages also. The N.E.R. Co. have decided to put down a railway passenger station on the coast line. An electric power station is being built at Easington Village, and the cable is being laid down to the new colliery, where another power station will be erected.

OF all the charming country in the neighbourhood of London, amongst the most consistently yet variably beautiful and healthy is that served by the L. & S. W. Railway. It embraces some of the prettiest stretches of the Thames, the expansive heaths and pine-woods of West Surrey, and the delightful scenery of the North Downs. All these districts are accessible for permanent residence by London business and professional men. In order to make known the charm of this country the L. & S. W. Railway Company have issued a most practical and useful guide-book giving information concerning residential districts of the outlying country. Its preparation has been entrusted to the Homeland Association, whose knowledge and experience is a guarantee of its accuracy and impartiality. The book, "Outer Suburbia and Beyond," which is illustrated with excellent plates, gives particulars of the railway distance, times, fares, season-ticket rates, average rents and rates, class of property available, water, illuminants, altitude, subsoil, death-rate, population and local authority, education and public worship; also recreative facilities. In addition there is a well-written descriptive sketch of each place, in which the characteristic features are well brought out. This book will be sent post free to any bona-fide applicant.

THE negotiations between the Amalgamated Society of Carpenters and Joiners and the Associated Society of Carpenters and Joiners with a view to the union of the two organisations have been resumed, and a meeting of representatives of both organisations was held in Glasgow this week for discussion of the subject. The negotiations of last year broke down over questions of detail, but it is hoped now that the difficulties will be overcome. The Amalgamated has its headquarters in Manchester, and the Associated in Glasgow, but the organisations overlap greatly all over the country. By joining they will be, it is hoped, says the *Glasgow Herald*, able to reduce greatly the cost of management and administration, and also to reduce the regular

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contributions which the members have to make. In the past the two societies, while quite friendly, have been compelled to compete for members, and the result has been that each has tried to outbid the other in the way of superannuation and other benefits. This, and the cost of management, has raised the rates payable by members higher than they would otherwise have been, but it is hoped that equitable arrangements can now be made about these and other matters of difference between the societies. The decision, if any, arrived at by the meetings this week will be placed before the membership of the two societies, who will be asked to vote on the question of amalgamation.

THE SANITARY EXHIBITION AT BRIGHTON.

AN important adjunct of the annual Conferences organised by the Royal Sanitary Institute, and of which the twenty-fifth opens at Brighton on Monday, September 5, are the health exhibitions. These introduce the necessary practical element to the Congress, and save it from the charge of being merely "words, words, words." The past exhibitions have played an important part in that extraordinary development of sanitary science which has occurred in the last quarter of a century. As we said last week in reference to the Congress generally, the exhibition practically illustrates the application and carrying out of the principles and methods discussed at the meetings; moreover, they educate a large class outside the range of those technical discussions, and who would otherwise derive no personal instruction from the Congress. It invariably happens that numbers of people visit and inspect the stands who could not be persuaded to sit through a conference. The exhibitions are therefore popular in more senses than one. The Royal Sanitary Institute have found that Brighton was an attractive venue to their members and to representatives of local authorities, &c., and the attendance is expected to be unusually good. The exhibition will be held in the Dome and in the Corn Exchange. Many of the firms are regular in their appearances at these congresses; others show for the first time. A few of the exhibitors are here mentioned; others will follow next week.

At Stand No. 33 the *Standard Range and Foundry Co., Ltd.*, Watford, will have their "Burkone" patent barless fire, in which the bottom portion of the firebrick container is shaped like a basin with a perforated iron cone in the centre; on this coal rests and burns brightly by reason of the circulation of air. The top portion of the brick has an overhanging part which reflects the heat from the fire back again into the fuel, and helps to insure a perfect combustion. The stove is fixed above the ground, and has an ashes-pan for removing any residue that there may be from the fire, thus enabling the fire to be kept burning continuously if necessary. The "Burkone" fire will be seen in various settings, including mantelpieces of whitewood, fumed oak, and mahogany. The *Standard Range and Foundry Co.* have also had mantel registers specially designed for their exclusive use. An interesting feature of the stand is their "Improved Municipal Combination Heating and Cooking Stove."

Messrs. Thos. Parsons & Sons, Ltd., varnish and japan manufacturers, Mitcham, have enamelled their stand, No. 19, with white "Endelline." The chief part of the exhibit consists of their enamels known as "Endelline," "Endelflat," and "Lacreite." They are also showing some good varnish panels, and specimens of wood-stains and "Mosaic" metallic paints. In addition there will be an interesting example of old heraldic work—a panel which was once part of the dress coach of Lord Dudley Ward; it was painted about 1790, and belonged formerly to Messrs. Vezey & Co., a Bath firm of coachbuilders who used this firm's varnishes for over a hundred years. It may be mentioned that when Messrs. T. Parsons & Sons commenced business in 1802 they chiefly catered for the needs of coachbuilders. The company opportunely issue a booklet entitled "Enamel and Health."

Practical instruction in the manufacture and uses of cement will be given on Stall 48, where the *Sussex Portland Cement Company* will have on show numerous samples, illustrating the different stages of cement making from the raw materials to the finished cement, various machines for testing for tensile strength, and apparatus for carrying out tests according to the British Standard Specification. Practical demonstrations of testing will be carried out at intervals during the day. The company claim to be the pioneers of the modern methods of grinding cement, and to now produce one of the finest ground cements in the world. Their "Newhaven" brand is guaranteed to fully comply with the revised British Standard Specification. The well-known "Cathedral" brand was first prepared for use on Winchester Cathedral.

Messrs. Bristowe & Co., Ltd., Broad Sanctuary Chambers, S.W., have taken two stalls—one, No. 41, in the Corn Exchange, and the other, No. 22, in the Dome. At the first will be shown the "H. H." series of sanitary fittings. These are sure to receive careful examination from all technical visitors to the Congress, for they embody much original thought, and in their details mark a departure from conventional patterns. The designer set himself to remedy the constantly-repeated mistakes which originated in a tendency to sacrifice form for appearance. The "H. H." fittings comprise baths, lavatories, lavatory fittings, closets, gullies, and grease traps. Another exhibit is Robbins's non-set plastic cement, which has been brought out by the proprietor of the original plastic cement (used in connection with patent pipe joints) after realising the necessity of a standard non-setting material for sealing manhole, electrical, cable, and inspection covers. Messrs. Bristowe & Co., Ltd., are sole agents for this; they are also agents for the "Coverwell" non-conducting composition for boiler and pipe coatings, Parker's safety pipe joint for making watertight sewers, the "Whalley" mixer for tarmacadam and concrete, and "Tarvia," all of which may be inspected on the company's two stands.

A distinctly sanitary exhibit is that of the *Berkefeld Filter Co., Ltd.*, at Stand No. 40, where prominence will be given to the "H." house filter, intended for use where there is a pressure in the main not exceeding 60 lbs. This was one of those dealt with by Dr. Sims Woodhead and Dr. Cartwright Wood in a report which appeared in the *British Medical Journal*. They wrote:—"We must conclude from the extensive series of experiments carried out with these Berkefeld filters that they afford complete protection against the communication of waterborne disease." The filter is of cast iron and yields under a pressure of 35 lbs. to 40 lbs. to the square inch about 25 gallons of water an hour; double this quantity is obtainable from the same pattern filter, but with three cylinders. On the same stand are the Berkefeld hospital filters, aseptic irrigators for supplying sterilised water of regulated temperature for use in surgical operations, together with other patterns, as well as the "Winco" semi-rotary wing pump.

At No. 65 wall space, *Messrs. Royles, Ltd.*, Irlam, near Manchester, will show illustrations of Row's patent aeration and filtration plant as erected all over the country in connection with public and private swimming baths. In this patent the water is pumped from the deep end of the bath through a strainer, and passed outside the building to an aerator or cooling tower, where the water is broken up into fine needle sprays, and so comes into contact with the atmosphere. From the aerator the water descends through the "Reisert" patent filter, where all suspended impurities are arrested. The water then passes through a re-heater, where it is reheated by the exhaust steam from the pump. The water then runs into the shallow end of the bath at the rate of several thousand gallons per hour, so converting the bath into a running stream and being continually re-oxygenated and filtered. The water, being thus purified and freshened, can be used in the bath for a much longer time than heretofore. The saving of water soon pays for the outlay on the plant, and the continuous fresh condition of the bath enables all bathers to have what are known as "clean water day conditions" at all times. Messrs. Royles, Ltd., are prepared to submit plans and estimates for complete plants for new baths, or for the application of the "Row's" patent to existing baths.

A representative display has been sent to Brighton by *Messrs. J. Tylor & Sons, Ltd.*, of their sanitary goods, which embody many important changes. The company seem to have especial success in work for schools. For instance, their "Regal" fireclay lavatory ranges have been supplied to the Royal Naval Colleges at Osborne, Devonport, and Dartmouth, as well as Duke of York's School, Dover. The Surrey, Kent, and Sussex education committees have adopted their "Surrey" four-person trough lavatory, in one piece, 6 feet long by 19 inches wide. The "Royal" lavatory range (in which two opposite basins are in one solid piece of fireclay), is in use at Haileybury College and Rodean School, Brighton. In their "Gravitation" system closet range the flushing cisterns over each closet are supplied and controlled from a supply tank, thereby dispensing with separate ball-valve overflows for each. *Messrs. Tylor & Son* will show several varieties of closets and lavatories, which may be seen in greater numbers at their showrooms in Tottenham Court Road, W. They embody the fruit of long experience in this kind of work.

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BANK AT ALNWICK.—Mr. GEORGE REAVELL, A.R.I.B.A., Architect.

LLOYDS NEW BANK AT ALNWICK.

LLOYDS BANK, LTD., acquired last year the premises adjoining their Bondgate branch, and decided to amalgamate the business carried on therein with that conducted in their Fenkle Street branch. Instructions were given to Mr. George Reavell, jun., A.R.I.B.A., for the rebuilding, and the designs prepared by him were adopted after careful consideration.

The English Renaissance was selected by the architect as the style in which the fullest expression of the purpose of the building could be conveyed. A range of five Ionic columns, with entablature and balustrade of the same order, embracing the first and second floors, stands on a ground storey of finely dressed masonry, with rusticated and recessed arched doorways. The richness of this composition is accentuated by the fine and appropriate carving of the keystones of the arches, the capitals to the columns, and the pendants at the sides of the window aprons, and as a foil to the whole the side bays are in plain polished ashlar, throwing into relief the principal block.

Internally, the banking hall is in keeping with the exterior, being panelled in richly moulded and polished mahogany for the greater part of its height, and fitted with counter and desks of the same material. The flooring over the vaults is of concrete, reinforced with steel, and covered with teak keylock blocks in the working part and Roman marble mosaic in the public space. The large windows in the north of the banking hall are in steel framing, with a stained-glass representation of the arms of the ancient town, St. Michael trampling on the dragon.

The artificial lighting is by electricity, the banking hall and manager's room having clouded glass bowls below the lamps, throwing the light to the ceiling, whence it is reflected in a soft and evenly distributed manner over these rooms. The details affecting security from fire and robbery have received the most careful attention.

The contract was let to Mr. Thomas Muckle, of Rothbury. The sub-contractors were as follows:—Messrs. Burn & Sons, of Spittal, for joiner work; Messrs. Reavell Bros., of Alnwick, for plumbing and electric lighting; Mr. J. Purdie, of Alnwick, for slating and plastering; Messrs. Adam Robertson & Sons, of Alnwick, for painting and glazing; Messrs. Thomas Robertson & Sons, of Alnwick, for mahogany panelling and fittings; Messrs. Hodkin & Jones, of Sheffield, for ferro-concrete and mosaic; Messrs. Henry Hope & Sons, of Birmingham, for leaded glazing; Breala Company, of Newcastle, for asphalte; Messrs. Emley & Son, of Newcastle, for marble work; Messrs. Chatwood & Co., of Manchester, for strong-room door; the Adjustable Metal Shelving Company, of London, for steel strong-room fittings; Mr. Christian Neuper, of Newcastle, for stone carving; Messrs. Murray, McVinnie & Co., of Glasgow, for keylock flooring; Mr. A. H. Henderson, of Alnwick, for blinds. The principal electroliers were made by Messrs. Powell & Son, of London. The whole has been carried out under the immediate supervision of the architect.

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THE KENTISH RAGSTONE QUARRIES.*

THE Wealden district embraces a remarkably distinct and well-defined area, and has received a large amount of attention from English geologists. Its boundary commences at Folkestone Hill, near the coast, and passes through Kent, Surrey, Hampshire and Sussex to the sea at Beachy Head. As a whole the Wealden area is fairly well supplied with stone, suitable both for building purposes and road metal.

The lower greensand everywhere—except in its Eastern range in Sussex—provides a good supply of material, and the best of this is obtained from the Hythe beds, which consist of interstratifications in about equal proportions of siliceous limestone and soft sandstone, the total thickness of which is about 80 feet. The former, termed "rag," is very compact, has a greyish-blue colour, and absorbs very little water. It has an average weight of 166 lbs. per cubic foot. In Page's *Text-book of Geological Terms* Kentish rag is described as "a highly fossiliferous grey, cherty or arenaceous limestone." The latter, which is called "hassock," is for the most part drab-coloured, impure, and rather clayey, with a salty taste, showing that the formation was originally by the sea. Some of these beds, however, are found to be so consolidated that the material can be used for building purposes.

Composition.

The following may be said to be the general composition of each:—

Kentish Rag.

Carbonate of lime	92.80
Earthy matter	6.30
Oxide of iron	0.50
Carbonaceous matter	0.40
	100.00

Hassock.

Carbonate of lime	26.30
Earthy matter	72.20
Oxide of iron	1.50
	100.00

The beds of ragstone vary in thickness from 8 inches to 3 feet. A typical section has alternate layers of rag and hassock beneath top layers of clay, carr stone, and false-bedded stone, and fuller's earth. Good sections may be seen in the Coombe Quarry at Tovil, near Maidstone. Here the whole of the Hythe beds consist of beds of Kentish rag with hassock between the layers. In the lower portion of the quarry the beds are apt, in the quarrymen's phrase, to become more "hassocky," and although this renders them valueless for road purposes, the harder kind is sometimes used for building.

It is necessary in a business of this description to economise transport of the stone from the quarry to the railway truck or barge. The approach to this quarry is by a short private road leading off the main road into Maidstone, and transport to the railway, or to the barges in the river Medway, is easily effected either by horse and cart or steam traction.

Most of the ragstone here is a good, close, bluish limestone, in beds from 1 foot 6 inches to 3 feet in thickness, but, as is invariably the case in all stone quarries, some of the beds of Kentish rag are of better quality than others. It might serve a useful purpose to tabulate these according to their respective qualities and characters. This, however, has up to the present not been attempted.

At the entrance to the quarry are situated the business offices, and adjacent to these are the works and apparatus for the manufacture of tar-macadam. Upon entering the quarry the first sight which meets the view is the succession of beds in varying thicknesses of the two different coloured stones—namely, the "rag" and "hassock." Out of a total depth of 80 feet about 50 feet is workable stone.

After the top layers of mould, clay and sand—the depth of which varies considerably—have been removed, the first bed of ragstone is laid bare. Suitable places are then selected by the quarry foremen, and holes drilled by means of hand-drills and "jumpers." These drills are forged from the best Sheffield drill steel. The borings are carried to a depth of two-thirds the thickness of the bed.

A charge of black powder is then inserted in the boreholes. The tamping in each of these is made with shale, rammed tight, wooden, gunmetal, or phosphor-bronze stemmers being used for ramming. Double-tape safety fuse is used for firing the shots, the fuse burning at the rate of 1½ feet per minute. Due warning is given to all the men in the quarry, either by the blowing of a whistle or by ringing a bell. The men then leave the quarry and the charge is fired.

Should a charge miss fire (which very rarely occurs), nobody is allowed near it for thirty minutes. In such a case the "shot-firer" immediately gives notice of the miss fire. No attempt is made to extract the charge, but after the lapse of thirty minutes another hole is bored near the first, care being taken to bore it in such a manner as not to affect or ignite the unexploded charge. The firing of the second charge will explode that in the first bore.

Owing to the action of gelignite and other similar explosives striking in all directions, it has been found that explosions by this means not only displace the ragstone, but also shatter, in a slight degree, the stone in close proximity to the bore. Black powder is therefore used where the stone is required to be displaced in sound blocks, for use in engineering or architectural works. Gelignite may, however, be used to advantage if the stone is to be used for road material only. All explosives are conveyed by the powder men from the magazine to the quarry and kept in boxes with locking lids, care being taken that no explosives are moved about in their naked condition.

The quantity and size of the pieces of stone removed as a result of a charge varies in proportion with the thickness of bed, the depth of hole drilled, and consequently the quantity of powder used. The average weight of the largest pieces is about 1½ to 2 tons. These are usually brought down to the main floor of the quarry by means of portable cranes. They are then split by hand-wedges to the sizes required and loaded into hand-trollies and wheel-barrows and taken to the dressing sheds.

After a portion of one layer has been worked it is generally found practicable and more economical to remove a considerable quantity of stone from the same stratum without the further use of powder. This is accomplished in the following manner. Holes are drilled on the top face of the rock (and as far back from the vertical face as practicable) and small hand wedges driven in at the sides of the portion to be removed. A cavity only sufficiently large to receive the shaped end of the steel crowbar is then prepared with hand picks in the layer of hassock immediately below the ragstone. The crowbar is then inserted and a large piece of ragstone (or other suitable rest) placed immediately under this, and a similar crowbar is attached by means of a steel collar. Upon these bars six or seven men stand, supported by long wooden stakes, and by performing a sort of fetish dance in the air the lever gradually sinks to the floor and the large block of stone is loosened.

The cost of Kentish ragstone rough-dressed in the quarry is from 6*s.* to 8*s.* per ton. It is used for building in regular coursed and random coursed work. The cost of the rag for these descriptions of wall facing is about 10*s.* 6*d.* per ton. One ton will cover about 3 yards super. The best of the hassock makes a suitable and cheap lining to ragstone house walls. The approximate annual output of stone from the principal Kentish ragstone quarries is some 137,000 tons.

This ragstone, partly on account of its attractive colour and excellent "weathering" properties, and also its comparative cheapness, has long been in popular favour in London and the South of England in the construction of important architectural and engineering works. Among other uses to which this stone is put may be mentioned sea and river walls, dock facings, reservoirs, milestones, bridges and culverts, forts (on Thames and Medway), sett paving, channels, kerbs and quadrants, and road metalling. The kerbs are made in varying sizes, as follows:—4 inches wide by 10 inches deep, 4 inches wide by 12 inches deep, 5 inches wide by 12 inches deep, and 6 inches wide by 12 inches deep; 45 feet of 4-inch by 10-inch kerbing weighs approximately 1 ton.

Ragstone forms an excellent material for road construction and repairs, and is used in large quantities by borough and district councils for that purpose. Of the total annual output from the Coombe, Preston Hall, and Allington quarries, about one-half is used for the purpose of road metalling. It is particularly well suited for hilly roads.

Its chief advantages are excellent "grip" and non-slipperiness. It is, however, unsuitable for road-making in constantly damp, low-lying districts.

Flints are plentiful, and may be dug out of the numerous chalk pits or picked off the fields. Those flints freshly obtained from the chalk are quite useless for repairing roads, being extremely brittle. They are therefore allowed to lie exposed for two or three years to weather, by which means they lose, to a great extent, their excessive brittleness and become tougher. Flints and "rag" make a better road than when either is used alone. These are usually mixed in the

* A paper read by P. Walton Harrison (Member), M.S.A., P.A.S.I., surveyor to the Warminster Rural District Council, at Paignton, before a district meeting of the Institution of Municipal Engineers.

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proportion of ragstone 75 per cent., flints (surface-picked or chalk) 25 per cent.

Abrasion Tests.

The following table gives the comparative figures between Kentish rag and other road stones:—

ABRASION TESTS OF MACADAM STONE. (E. H. LOVEGROVE, M.I.C.E.)

Limestones.

Note.—Charge of stone, 4 lbs. 8,000 revolutions at 20 revolutions per minute.

Wet Test.—About ¼ gallon of water added to cylinder after stone has been placed therein. Weights taken after the stone has been again dried.

Dry Test.								Wet Test.					
Weight of 4 lbs. of Stone after Testing.			Difference in Weight per Cent.			Petrographical Nature.	Specific Gravity.	Machine or Hand-broken.	Place of Origin.	Weight of 4 lbs. of Stone after Testing.			Difference in Weight per Cent.		
			Chips.	Dust.	Total.								Chips.	Dust.	Total.
Lbs.	ozs.	drms.								Lbs.	ozs.	drms.			
3	2	11½	4.49	16.26	20.75	Dark limestone	2.72	H	Buxton Lime Co.'s Quarries, Buxton	3	0	3	2.34	22.36	24.70
3	1	5	3.61	18.36	21.97	,, ,,	2.7(	—	Walls Hill Quarry, Torquay	2	5	9½	7.03	34.22	41.25
3	1	6½	6.49	16.31	22.80	,, ,,	2.79	—	Churston Quarry, Torquay	2	8	3	3.56	33.64	37.20
2	9	0½	10.30	25.59	35.89	,, ,,	2.81	—	Coombe Quarry, Torquay	2	1	7	5.57	42.19	47.76
2	3	9½	1.85	17.53	19.38	,, ,,	2.71	H	Burton St. Mary Church Quarries, Devon	2	9	13	3.95	30.71	34.66
2	7	8½	.00	13.23	13.23	Magnesian limestone	2.70	H	Lady Lee Quarries, Worksop	2	12	11	4.34	25.83	30.17
3	5	0½	.83	16.31	17.14	,, ,,	2,6o	H	Kentish Rag from Coombe Quarry, Maidstone	2	14	7	.00	27.44	27.44
3	9	8	1.22	8.94	10.16	Limestone	2.84	M	Chapel Hill and Hangstone Quarries, Somerset	3	6	2	2.10	13.33	15.43
3	2	0	5.42	16.45	21.87	Red stone (dolomite)	2.80	M	Similar to Kentish rag from Devon	2	6	8½	6.15	39.64	39.79

Tar-Macadam.

The rag makes excellent tar-macadam, being, by the nature of its composition, able to absorb an appreciable quantity of tar. Ragstone differs in this respect from most of the igeneous rocks, which, by reason of their too compact or crystalline nature, are able to absorb only a very small proportion of tar, which in many cases is little more than a surface coating that soon wears off. The following are the general methods adopted for the preparation of tar-macadam:—

The ragstone, having been broken (by hand or mechanical breakers), is taken, after screening, to the drying floors, which are constructed of large metal plates under which flues from large furnaces run up and down, and laid to a thickness of 5 inches or 6 inches. It is allowed to remain spread for twelve to fourteen hours—generally through the night—by which time it is found to be thoroughly dried and the whole of the natural moisture evaporated. This renders it in a better condition to absorb the tar.

Absorption of Water by Stone.

	Volume of water absorbed expressed as percentage of volume of stone.
Granite	from ½ to 3
Sandstone	from 8 to 20
Portland stone	13.5
Bath stone	17.0
Ketton	15.1
Chilmark	8.6
Kentish rag	1.5

It is then mechanically mixed with boiling tar at a temperature of about 180° Fahr., in revolving cylinders fitted with a continuous screw, and fixed at such an angle and in such a way that the stone is propelled forward and the superfluous tar is able to run back to the mouth of the cylinder. By this means it is found that the stone on being discharged has absorbed sufficient tar not only to render it waterproof, but eventually, when pressure is applied, to form a homogeneous and concrete mass. On an average 13 to 16 gallons of tar are used to every cubic yard of stone, varying according to the coarseness or fineness of the material to be treated.

This is the process adopted for the production of "bottoms"—*i.e.* the coarser gauges—and when an extra quantity of "toppings" is wanted an additional stage in the work becomes necessary; and anything proving above 1½-inch gauge is passed through a subsidiary breaker, known as a granulator, and the stone is reduced to either ⅜ inch or ⅝ inch, whichever gauge is required.

THE Chertsey Rural District Council have received a letter from the Public Works Loan Commissioners sanctioning the loan of 26,725*l.* required by the Council for carrying out the Byfleet sewerage scheme. The work can now be proceeded with.

MOORISH MARBLE QUARRIES.

As far back as the days of Imperial Rome the classical builders drew some of their supplies from the quarries of Spain. In the dark ages that followed the quarries were neglected and forgotten until their product was needed by the Moorish builders. Mr. A. E. Carleton, U.S.A. Consul of Almeria, furnishes the following report covering the workings of the old marble quarries at Macael, Spain, by the Moors and the establishment of up-to-date quarries in the Chercos Mountain.

In the days of Moorish dominion in Spain the quarries in the Macael district were of considerable importance, and much of the marble in the Alhambra came therefrom. The marble extracted is white in colour, coarse-grained, with straight gray or blackish markings. The method of extraction has not varied since the quarries were first opened. The marble is obtained by cutting grooves in the rock with hammer and chisel, and then, by a number of small wedges driven into these grooves, the pieces are split off, afterwards being squared by hand labour. Transportation is likewise primitive, as the marble is carried from the quarries to the little water-power sawmills by means of ox carts. The blocks are sawed into slabs of varying thicknesses. The water-power is available for only a few months of the year.

Owing to a heavy tariff on imported marble the Macael variety is in good demand throughout Spain on account of its cheapness, as compared with Italian marble, the average price per square metre (10.76 square feet) for ¾-inch slabs being $1.08, and for blocks $25 to $34 per cubic metre (35.316 cubic feet). The natural difficulties, however, together with lack of sufficient capital and lack of organisation, have always retarded the development of the quarries, and now the industry itself is threatened seriously with organised competition at its very doors.

Some time ago a group of English capitalists acquired a number of quarries and marble-bearing properties in this district, and discovered in the mountain of Chercos an immense deposit of white marble of a faint bluish tint, with veins and markings similar to the ordinary Italian marble, the only difference between it and the latter being in the coarseness of the grain. Wire saws are being used for cutting the masses from the mountain as well as for squaring the same into blocks, and machinery is installed for handling masses up to 70 tons and for supplying finished blocks up to 15 tons. Transport is effected by traction engines capable of drawing 30 tons at one load.

The works in Albanchez have been equipped with the most modern and up-to-date machinery, the motive power being obtained from two 80 h.p. suction gas engines and plant. Six frame-saws for cutting the marble into slabs have been mounted, each of which can carry seventy blades and produce slabs 11 to 15 feet in length. The installation includes diamond saws, carborundum moulding and cutting machinery, polishing and disc machinery, &c. The railway station is at Almanzora, about forty miles from Aguilas, the nearest port of shipment.

THE Oxfordshire County Council give formal notice of their intention to provide a new public elementary school for about 150 children at Sonning Common in the parish of Eye and Dunsden.

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Cathedrals and Abbeys of England.

The Publisher desires to intimate that no copies containing Cathedral Plates can be supplied unless the date of the issue, as well as the name of the Cathedral, be given on application. The charge for any number containing Cathedral Plates published previous to January 1910, is **6d.** Further lists will be published in subsequent issues.

LINCOLN.

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Chapter-house	January 1, 1897
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ELY.

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SALISBURY.

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NORWICH.

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THE

Architect and Contract Reporter.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

ANTWERP.—Oct. 1.—An international competition is being arranged for a scheme for the laying out of the land surrounding Antwerp, which will shortly be available by the demolition of the encircling fortifications. Premiums of 1,000*l.*, 400*l.*, and 200*l.* are offered. Copies of the conditions, &c., may be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C., or, on payment of 100 francs from the "Commission d'études de l'aménagement de l'agglomération anversoise," 57 Rue du Jardin des Arbalétriers, Antwerp.

BELFAST.—Sept. 15.—The Senate of the Queen's University are prepared to receive designs for the enlargement of the present buildings at a cost of about 52,000*l.* Assessor, Sir Aston Webb, R.A. Two premiums of 150*l.* and 100*l.*; particulars 2*l.* 2*s.*, returnable within three weeks, or on receipt of *bona-fide* design. Mr. J. M. Finnegan, B.Sc., secretary, Queen's University, Belfast.

IRELAND.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

IRELAND.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.



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MANCHESTER.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

RUISLIP.—Nov. 15.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

WALES.—Sept. 19.—The town hall committee invite competitive designs, &c., for the proposed alterations and additions (not exceeding in cost 3,000*l.*) to the town hall and market hall, Maesteg. Conditions, with a plan of site and sections at ground level, may be obtained from Mr. Samuel J. Harpur, engineer and surveyor, Town Hall, Maesteg. Two premiums are offered, namely, 25 guineas and 10 guineas, as first and second respectively. The committee do not bind themselves to award the premiums, and they do not intend to engage the authors of the designs for which premiums may be awarded to carry out or supervise the work.

WALES.—Oct. 1.—The Town Council of the borough of Denbigh invite competitive plans and designs of a public hall, markets, municipal buildings, &c., which it is proposed to erect at a cost not to exceed 10,000*l.* Three premiums are offered, viz. 75*l.*, 30*l.* and 20*l.*, as first, second and third respectively. Send 1*l.* 1*s.* deposit for particulars, &c., Mr. J. Parry Jones, town clerk, Denbigh.

CONTRACTS OPEN.

ANNFIELD PLAIN.—Sept. 19.—For erection of a picture theatre at Annfield Plain, Durham. Mr. L. H. Armour, 16 West Street, Gateshead.

BIRMINGHAM.—Sept. 22.—For the erection of a police station at the corner of Digbeth and Allison Streets. Send 2*l.* 2*s.* to the City Treasurer. Messrs. Mansell & Mansell, quantity surveyors, 47 Temple Row, Birmingham.

CARLISLE.—Sept. 12.—For new urinal, lavatories, and w.c.'s in yards at Harraby Hill House. Mr. George Armstrong, architect, 24 Bank Street, Carlisle.

CAMBRIDGE.—Sept. 14.—For erection of a cottage in Albion Row. The Borough Surveyor, Guildhall, Cambridge.

CHARNEY-BASSETT.—Sept. 15.—For erection of small holding farm buildings and alterations to existing farm buildings. Deposit 1*l.* 1*s.* The County Land Steward's Office, Assize Courts, Reading.

DOUGLAS.—Oct. 1.—For new mission hall and Sunday school at St. Matthew's, Douglas, Isle of Man. The Rev. H. S. Taggart, M.A., St. Matthew's Vicarage, 2 Mount Havelock.

DUBLIN.—Sept. 23.—For erection of a fire brigade station, Thomas Street. The City Architect, Municipal Buildings, Cork Hill, Dublin.

DURHAM.—Sept. 20.—The Durham County Council invite sole tenders for new Council schools at Mount Pleasant, Spennymoor, and Close House (near Bishop Auckland), manual instruction room at Ryhope, and alterations at Broompark Council school. (1) Mount Pleasant, Spennymoor (for about 350 scholars), Mr. W. Rushworth, Shire Hall, Durham. (2) Close House (for about 500 scholars), manual room at Ryhope, and alterations at Broompark. Mr. N. Richley, Shire Hall, Durham.

ECCLESTON.—Sept. 24.—For erection of an elementary school at Eccleston, near St. Helens, to accommodate 170 scholars. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

EPPING.—Sept. 10.—For works in connection with the proposed cemetery at Epping, Essex, for the Epping Urban District Council, viz.:—(1) Laying-out, including surface drainage, construction of roads and footpaths; (2) erection of gates and fences; (3) building chapel and tool shed. Persons desiring to tender should apply by Sept. 10 to Mr. G. J. Creed, clerk, Epping.

EXETER.—Sept. 14.—For certain general reparation, painting, &c., to the workhouse. Mr. R. M. Challice, architect, 14 Bedford Circus, Exeter.

FERRING AND DURRINGTON.—Sept. 12.—For building a wall at The Clappers, Ferring; also for laying a storm-water drain at Durrington Lane, Durrington, for the East Preston Rural District Council. Mr. Arthur Shelley, clerk, Littlehampton.

HALIFAX.—Sept. 10.—For extensions to Kingston bakery for Messrs. J. Whittaker & Sons. Mr. Thomas Kershaw, A.R.I.B.A., architect, L. and Y. Bank Chambers, Halifax.

HAWKINGE.—Sept. 10.—For erection of a porch, heating chamber, &c., at the Hawkinge Council School, Kent. Mr. W. Thomas, correspondent, 66 Broadmead Road, Folkestone.

HINDLEY.—Sept. 12.—For erection of cart sheds in the stable yard, Cross Street. Deposit 1*l.* 1*s.* Mr. Oswald P. Abbott, surveyor, Council Offices, Hindley.

HURST.—Sept. 15.—For erection of small holding farm buildings at Church Farm. The County Land Steward's Office, Assize Courts, Reading.

IRELAND.—Sept. 12.—For erecting twenty-eight single cottages and fencing plots for same; also for fencing further five plots for the Rural District Council. Payment 5*s.* Mr. B. Manning, clerk to the Rural District Council, Workhouse, Rathdrum.

IRELAND.—Sept. 14.—For erection of one single and five pairs of labourers' cottages, for the Rathdown No. 2 Rural District Council. Mr. Patrick Cunniam, clerk to the Rural District Council, Loughlinstown.

IRELAND.—Sept. 15.—For enlargement and repairs of the Woodburn National School. Mr. S. V. Stirling, teacher, Woodburn, near Carrickfergus.

IRELAND.—Sept. 19.—Tenders for erection of a Crown post-office at Roscommon. The Office of Public Works, Dublin, and the Post Office, Roscommon.

IRELAND.—Sept. 24.—For erecting and fencing thirty-nine single cottages at Ballynahinch, Ballyrange, and Tullyboard, for the Rural District Council, at not more than 140*l.* each. Mr. R. L. Morrow, clerk to the Council, Downpatrick.

LEEDS.—Sept. 21.—For the whole or any of the separate trades in connection with erection of the education block of the City of Leeds Training College, Beckett's Park, Headingley. Send names and 2*l.* 2*s.* deposit by Sept. 12 to Mr. James Graham, secretary for education, Education Department, Calverley Street, Leeds.

LEYTONSTONE.—Sept. 15.—For erection of Leytonstone sorting office. Mr. J. Rutherford, H.M. Office of Works, Carlisle Place, S.W.

LONDON.—Sept. 15.—For the erection of a green-house and potting-shed at Wandsworth Cemetery, Magdalen Road. The Borough Engineer's Office, 215 Balham High Road, S.W.

LONDON.—Sept. 20.—For alterations and additions to the laundry at Brentford Workhouse, Isleworth, W. Send 2*l.* 2*s.* to Mr. W. Stephens, clerk, Union Offices, Isleworth, W. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

LONG SUTTON.—Sept. 15.—For improvement works and repairs upon the Market House. Mr. W. H. H. Davis, architect, 2 York Row, Wisbech, or Messrs. Mossop & Mossop, clerks to the Market House Company, Long Sutton, Lincs.

MALTBY.—Sept. 23.—The West Riding Education Committee invite whole or separate tenders in connection with the Maltby new school, viz. builder, joiner, tiler, plumber, plasterer, painter, and asphalter. The Education Architect, County Hall, Wakefield. Send 1*l.* 1*s.* deposit to the West Riding Treasurer, County Hall, Wakefield.

MANCHESTER.—Sept. 14.—For the construction of two public urinals adjoining the Didsbury Hotel, Wilmslow Road, Didsbury, and the Coach and Horses Hotel, Stockport

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Road, Longsight. Send 1*l.* 1*s.* deposit to the City Treasurer, the City Surveyor's office, Town Hall, Manchester.

MARKET HARBOROUGH.—Sept. 14.—For the erection of a police court, superintendent's house, stables, and alterations to existing buildings. Deposit 3*l.* 3*s.* Mr. S. Perkins Pick, F.R.I.B.A., county architect, 6 Millstone Lane, Leicester.

MINSKIP.—Sept. 16.—For proposed farmstead at Minskip, near Boroughbridge. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

OCKFORD.—Sept. 20.—For erection of pumping station buildings at Ockford, near Godalming. Deposit 1*l.* 1*s.* Mr. J. H. Norris, borough surveyor and water engineer, Municipal Buildings, Godalming.

PENGE.—Sept. 17.—For additions and alterations to their offices, Town Hall, Anerley Road, S.E., for the Penge Urban District Council. Send at once names and addresses, with a deposit of 2*l.* 2*s.*, to Mr. H. W. Longdin, architect, Town Hall, Anerley.

PORTSMOUTH.—Sept. 12.—For constructing, supplying and maintaining in thorough repair for six calendar months from the completion of the whole thereof, the following works:—(1) A waiting room for visitors and bicycle store at the north-east entrance of the town hall, and (2) alterations and additions to the borough engineer's offices at the town hall. The Borough Engineer's Office, Town Hall, Portsmouth.

ST. HELENS.—Sept. 13.—For building a small power house near to Windle Smithies, for the Rainford Gas Company, for the Gas Committee. The Gas Works Office, Warrington Old Road.

ST. HELENS.—Sept. 12.—For erection of a secondary school for boys in Cowley Hill Lane, St. Helens, Lancs. Deposit 1*l.* 1*s.* Mr. Frank S. Biram, architect, George Street, St. Helens.

SADDLEWORTH.—For the whole of the additions to the stable buildings, &c., at the Saddleworth Union Workhouse. Deposit 10*s.* 6*d.* Master of the Workhouse, Running Hill, Dobcross, or Mr. F. Thorpe, architect, 7 Clegg Street, Oldham, and Wadelock, Uppermill.

SCOTLAND.—For the following works connected with proposed alterations on and additions to the Berwickshire High School at Duns, for the School Board, viz.:—Digger, mason and brick work, carpenter, joiner and glazier, slater and rough cast, plumber and gasfitter, plasterer and cement, pavior works, tile work, heating, painter work, classroom fittings, ironmonger work. Mr. Wm. Home Waite, clerk, 12 Newton Street, Duns, or Messrs. R. A. Bryden & Robertson, architects, 147 Bath Street, Glasgow.

SCOTLAND.—Sept. 13.—For carrying out alterations and additions to Helensburgh Post Office, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Post Office, Helensburgh, or H.M. Office of Works, 3 Parliament Square, Edinburgh.

SCOTLAND.—Sept. 14.—For the mason, joiner, plaster, plumber, slater, painter and glazier, and iron works, of additions to and alterations on Knowepark and the Senior Burgh schools, for the Selkirk School Board. Messrs. J. & J. Hall, architects, Galashiels.

SCOTLAND.—Sept. 20.—For erection of four cottages for farm servants and four cottages for attendants at Bangour Village, Uphall. Messrs. Peter Lawrence & Co., surveyors, 50A Frederick Street, Edinburgh.

SCOTLAND.—Sept. 20.—For the mason, joiner, slater, plumber, and plasterer work of four new houses to be erected in Morebattle. Messrs. Main & Shanks, solicitors, Kelso.

SITTINGBOURNE.—Sept. 19.—For the erection of a temporary building at the County School for Girls. Mr. E. C. Pearcey, local secretary, 45 High Street, Sittingbourne, Kent.

SOUTHALL.—Oct. 4.—For the following, for the Southall Norwood Urban District Council, viz.:—(*a*) Boiler house; (*b*) hot-water heating; (*c*) hot-water supply at the sanatorium; and (*d*) paving works; and (*e*) channelling work. Mr. Reginald Brown, A.M.I.C.E., F.S.I., &c., engineer and surveyor, Public Offices, Southall, Middlesex.

SOUTHAMPTON.—Sept. 19.—For alterations and heating apparatus to cells at the Winchester county police station. Deposit 1*l.* 1*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

SPRINGHEAD.—Sept. 16.—The West Riding Education Committee invite whole or separate tenders for the following works, viz.:—Springhead Council school (builder, plumber, and asphalter), asphalting and general repairs. The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the County Treasurer.

STANLEY.—Sept. 14.—For erecting classroom for the Stanley Church schools, Derby. Messrs. Heazell & Sons, architects, Nottingham.

STOCKPORT.—Sept. 13.—For erection of stabling, cart sheds, &c., to be entirely completed by December 31, 1910, for the Stockport Industrial and Equitable Co-operative Society, Ltd. Messrs. Wrathmell & Blackshaw, architects, Queen's Buildings, St. Peter's Square, Stockport.

STOCKPORT.—Sept. 13.—For sanitary improvements to forty-one houses in Huntsman's Brow, Society Street, Divi Street, and Co-operative Street, for the Industrial and Equitable Co-operative Society, Ltd. Messrs. Wrathmell & Blackshaw, architects, Queen's Buildings, St. Peter's Square, Stockport.

TAMWORTH.—Sept. 15.—For the erection of a handicraft centre on the site of the Boys' Council school. Deposit 10*s.* 6*d.* Mr. Graham Balfour, Director of Education, County Education Office, Stafford.

TEWKESBURY.—Sept. 16.—For alterations at the old buildings of the Tewkesbury Grammar School. Mr. H. A. Badham, secretary, Tewkesbury.

UPPERBY.—Sept. 13.—For the work required in erection of a new mixed school and for alterations and additions to infants' school, Upperby, Cumberland. Mr. J. Forster, M.S.A., architect, 13 Earl Street, Carlisle.

WAKEFIELD.—Sept. 14.—For new house and alterations to existing house and farm buildings at Bond Hill Ash Farm, Copmanthorpe, near York. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

WALES.—Sept. 10.—For the erection of a building to be used as a drinking fountain on Leigh Road, freehold land, Pontypool, for the Abersychan Urban District Council. Mr. W. H. V. Bythway, clerk, Pontypool.

WALES.—Sept. 10.—Contractors desirous of tendering for the new drill hall to be erected at Colwyn Bay for the 5th Batt. Royal Welsh Fusiliers are requested to send their names in not later than the 10th inst., accompanied by a deposit of 10*s.* 6*d.*, to Messrs. J. M. Porter & Elesek, architects, Estate Office, Colwyn Bay.

WALES.—Sept. 12.—For the erection of thirty-one houses and the construction of the necessary roads at Cwmtillery, for the Abertillery Urban District Council. Deposit 1*l.* 1*s.* Mr. Lionel D. Lewis, engineer, King Street, Abertillery.

WALES.—Sept. 13.—For erecting a residence at Aberporth. Capt. J. Davies, Step, Aberporth, R.S.O., Cardiganshire.

WALES.—Sept. 13.—For proposed extensions to co-operative stores, Blaengarw. The Stores.

WALES.—Sept. 13.—For certain alterations and repairs to Bethel Welsh Congregational Church, Tonyrefail. Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy, or Mr. Stephen Evans, Bon Marche, Tonyrefail.

WALES.—Sept. 16.—For carrying out alterations and additions to Tredegar House, Tredegar. Mr. T. Edmund Rees, architect and surveyor, The Walk, Merthyr Tydfil.

WALES.—Sept. 16.—For the carrying out of the following works for the Rhondda Urban District Council, viz.:—(1) Extensions at Ynyshir Council school (girls' department); (2) extensions at Tonypandy Council school (infants' department). Send 1*l.* 1*s.* deposit in each case to the Accountant of the Council. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WALES.—Sept. 16.—For erection of a domestic science and manual instruction centre at Willowtown Schools, Ebbw Vale. Deposit 2*l.* 2*s.* Mr. Hy. Waters, M.S.A., architect, Market Chambers, Ebbw Vale, Mon.

WALES.—Sept. 19.—For extensions and alterations to the Pantygasseg Council school, near Pontypool; also for extensions and alterations to the Pengam Council school, Pengam, for the Monmouthshire Education Committee. Deposit 1*l.* 1*s.* Mr. John Bain, F.R.I.B.A., County Council Offices, Newport, Mon.

WALES.—Sept. 22.—For erection of 240 houses and 10 shops on the Glyn Gwyn Estate at Bedwas, Mon., for the Tre Thomas Building Club. Mr. James T. Jenkins, architect and surveyor, Porth, Glamorgan.

WALES.—Oct. 1.—For building a school (accommodation 500) at Hendy, Pontardulais, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., County Architect, County Education Offices, Carmarthen.

WELLINGTON.—Sept. 24.—For erection of a secondary school to accommodate 200 pupils at Wellington, Salop. Messrs. Shayler, Swan & Ridge, joint architects, 16 Pride Hill, Shrewsbury. Send 3*l.* 3*s.* deposit to Mr. W. Windsor, quantity surveyor, 37 Brown Street, Manchester.

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TENDERS.

BANBURY.

For erection of business premises at Middleton Cheney, for the Banbury Co-operative Industrial Society, Ltd. Mr. FREDERICK J. COOKE, architect, Banbury.

Broughton	£1,886 0 0
Allitt & Son	1,427 15 0
Turner	1,410 10 0
Orchard & Son	1,297 0 0
Kimberley	1,234 0 0
BOOTH & SON, Banbury (*accepted*)	1,209 0 0

BARNOLDSWICK.

For the works connected with the widening of a portion of Church Street. Mr. W. BENNETT, M.I.M.E., surveyor.

Hayes	£420 10 8
Sugden	410 2 3
Macdonald	370 0 0
Ward & Tetley	365 16 1
Muff & Randell	347 15 7
Clegg Bros.	347 9 5
CLEGG, Barnoldswick (*accepted*)	339 14 10

DUBLIN.

For the wiring and fittings for electric lighting of the workhouse, James's Street, for the Guardians of the South Dublin Union. Mr. L. J. LAWLESS, engineer, Rathmines, Dublin.

Ampere Electrical Co.	£4,400 0 0
Fletcher & Philipson	3,812 14 9
Edmundsons	3,489 0 0
Egan & Co.	3,253 12 6
Johnson & Philips	3,036 0 0
A. E. G. ELECTRIC Co., Manchester (*accepted*)	2,537 4 0
Maintenance.	
Ampere Electrical Co.	2,522 0 0
Fletcher & Philipson	1,000 0 0
A. E. G. ELECTRIC Co., Manchester, (*accepted*)	250 0 0

ELDON.

For drainage, walling, &c., of the Eldon churchyard, Durham.

Manners	£558 7 9
Moore	474 2 10
Hilton	461 9 9
Carrick	446 10 8
Hudson	427 5 11
Bell	425 7 9
Brown	410 1 6
HOPE & SONS, Coundon (*accepted*)	383 7 2
Thompson	374 6 3

GLASGOW.

For the erection of a concert hall at the Scottish Exhibition of National History, Art, and Industry, 1911. Messrs. WALKER & RAMSAY, architects, Glasgow.

HENDERSON, Glasgow (*accepted*)	£9,553 9 0

HONINGTON (SHIPSTON-ON-STOUR).

For alterations and additions to Honington Lodge, for Sir Grey Skipwith, Bart. Mr. C. M. C. ARMSTRONG, architect, Warwick.

Foster & Dicksee	£1,890 0 0
Cashmore & Sons	1,829 0 0
Bowen's Executors	1,745 0 0
Groves & Sons	1,667 0 0
Hollowell	1,648 0 0
Fincher & Co.	1,596 15 6
Broad & Co.	1,595 0 0
Whittall & Son	1,589 0 0
Smith & Sons	1,494 0 0
COLLINS & GODFREY, Tewkesbury (*accepted*)	1,488 0 0

MIDSOMER NORTON.

For the erection of motor garage and workshop. Mr. WILLIAM F. BIRD, architect, Midsomer Norton.

W. & A. Edgell	£1,039 0 0
Heal	835 0 0
Coles Bros.	820 0 0
CATLEY (*accepted subject to revision*)	780 0 0

IRELAND.

For constructing concrete culvert, 547 yards long, at Castle Hill, with manholes, &c., Knock, near Belfast. Messrs. SWINEY & CROASDAILE, MM.I.C.E., Belfast.

Stafford	£1,689 6 6
Irish Armoured Tubular Flooring Co.	1,664 13 0
Workman	1,624 8 0
J. & R. Thompson	1,586 0 0
Geddis	1,502 15 8
Hyslop	1,199 10 6
Graham	1,174 0 0
Pollock	1,150 3 0
Ross & Son	1,137 0 2
R. & J. PIERCE, Belfast (*accepted*)	1,070 16 0

LONDON.

For building the temporary public carriage office, New Scotland Yard. Mr. J. DIXON BUTLER, F.R.I.B.A., architect and surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Killby & Gayford	£3,670 0 0
Grover & Son	3,642 0 0
Appleby & Sons	3,580 0 0
Perry & Co.	3,554 0 0
F. & H. Higgs	3,525 0 0
King & Son	3,490 0 0
Higgs & Hill	3,484 0 0
Prestige & Co.	3,484 0 0
Holloway Bros.	3,400 0 0
Holland Hannen	3,377 0 0
Patman & Fotheringham	3,373 0 0
Mowlem & Co.	3,300 0 0
Godson & Sons	3,287 0 0

MANNINGTREE.

For construction on the Hennebique system of a bridge over the River Stour, near Manningtree, Essex. Messrs. H. MILLER, M.I.C.E., and P. J. SHELDON, M.I.C.E., county surveyors.

Chessum & Sons	£3,682 0 0
Davidson & Miller	3,579 14 0
Garratt & Son	3,448 0 0
Playfair & Toole	3,181 0 0
Liverpool Ferro-Concrete Contracting Co.	3,013 13 0
Yorkshire Hennebique Contracting Co.	2,328 0 0
Smith & Co.	2,220 5 4
KAVANAGH & Co., Surbiton Hill, S.W. (*provisionally accepted*)	2,167 16 0

PADIHAM.

For the erection of Hapton Council school.

Helm, Padiham (*recommended*)	£4,627 10 6

There were eight tenders.

SOUTH ELMSALL.

For the reconstruction of the sewage disposal works at South Elmsall, Yorks, for the Hemsworth Rural District Council. Mr. T. H. RICHARDSON, engineer, Hemsworth.

Bushby & Sons	£3,157 10 10
Gray & Sons	2,505 0 0
Whitaker	2,470 8 11
Taylor	2,417 4 5
Hannon & Co.	2,400 0 0
Podmore	2,372 2 0
Williams & Carnell	2,350 0 0
Graham & Sons	2,300 0 0
Sugden	2,263 12 6
Rhodes Bros.	2,246 0 0
Haigh	2,229 13 9
Auld	2,198 9 4
Hanley	2,195 11 0
Ward & Tetley	2,129 14 2
Berry	2,062 19 2
Swift Bros.	2,050 0 0
Newton	2,010 18 7
Lacy	1,989 13 8
Rhodes	1,977 0 0
Mason	1,964 12 6
ROTHERA, Hemsworth (*accepted*)	1,929 4 5

WARRINGTON.

For the erection of the Evelyn Street Council school. Mr. T. A. BUTTERY, F.I.A.S., architect, Morley.

DOLAN & SON, Warrington (*accepted*)	£11,767 6 0

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ECONOMY IN WATER SUPPLY.*

THE question of the provision of fresh sources of water supply is becoming more important every year, and therefore all water authorities should take the greatest possible care to conserve the existing supplies.

With proper regulations and strict supervision the consumption of water can be kept within legitimate limits, with due regard to the comfort and health of the consumers. Regulations for this purpose were originated and have been in force with the best results for a great number of years in towns where the supply of water has always been given on the constant system. Closer attention to this question has in recent years led to great economies, as may be instanced in the cases of two important towns in the West Riding of Yorkshire, where the consumption of water has been so materially reduced that whilst in both these towns a constant supply has been fully maintained, the expenditure of large amounts of capital on additional works which otherwise would have had to be incurred has been considerably deferred.

All waterworks authorised by Parliament have to be maintained out of revenue in accordance with the provisions of the Waterworks Clauses Act, 1847, which is now incorporated in all special Water Acts.

In the case of gravitation works, so far, at any rate, as impounding reservoirs are concerned, there is practically no depreciation. An earthen embankment fifty years old is probably a stronger structure than one ten years old. In pumping schemes, first-class machinery which was erected seventy or eighty years ago is in existence and in good condition. Large trunk mains are in existence and in good condition which have been in use for a much longer time than is now generally allowed for the period of repayment.

Under these circumstances it is permissible to doubt whether some of the severe restrictions with regard to repayment of loans now in force are really beneficial either to the consumer or to the ratepayer. They afford, however, a very strong reason for the exercise of the strictest economy in the distribution of the water, so that if possible a revenue may be earned sufficient to provide the necessary payments to the sinking fund and to avoid a rate in aid.

This question arose during the present session of Parliament in the case of a Bill promoted by an important water board which was formed in the year 1897, when the undertaking of a waterworks company was transferred to four constituent authorities. In 1899 it became apparent that larger works were necessary if the water board were to perform their duties properly, and accordingly in that year the construction of an additional storage reservoir was commenced. This reservoir was estimated to cost 157,000*l.*, and the Local Government Board, having approved of the scheme, sanctioned the borrowing of that amount of capital, but granted only thirty years for the repayment of the loan.

The water board promoted a Bill to authorise the construction of additional waterworks and to sanction sixty years as the period for the repayment of the loan for the works proposed to be authorised by the Bill, and also to sanction a like period for the repayment of the loan for the construction of the works already sanctioned by the Local Government Board. The water board had previously applied for an extension of the time for the repayment of this loan, but this was refused by the Local Government Board, who also opposed the application in Parliament. It was shown that by reason of the board having to provide the sinking fund through such an abnormally short space of time as thirty years a rate in aid was inevitable.

The result was that the Committee granted fifty-five years for the repayment of the loan required for the works proposed under the Bill, but refused to interfere with the decision of the Local Government Board with regard to the period of repayment of existing loan. They, however, expressed the opinion that on the evidence before them it was a case in which a more extended period might reasonably have been given by the Local Government Board, and that this was a case in which that Board might review their decision, and they invited the water board to appeal to the Local Government Board for reconsideration of their case. This was done, with the result that the Local Government Board extended the time for repayment to forty years. This, however, is still too short a period in such a case.

With the strictest economy, however, the water authorities must from time to time be faced with the necessity of providing additional supplies of water, and before this becomes urgent care should be taken to ascertain by observations extending over as long a period as possible, the rainfall of the district from which the supply is to be obtained, accompanied, in the case of surface supplies, by stream gaugings where possible, and, in the case of pumping schemes, the rest level of the water in the area in which the well is to be sunk. All these are necessary before a scheme can be properly placed before Parliament for consideration, and generally their ascertainment is a hurried one, leading to possibly unnecessary opposition and expense.

The information to be obtained from the British Rainfall publications is useful, but as a rule it has to be supplemented at the last moment by special observations extending over a short period, whereas, if water authorities would co-operate and arrange for rainfall observations to be carried out by, or in conjunction with, the Director of British Rainfall, they would, at a comparatively small cost, be in possession of the information whenever required.

The geological conditions should also be fully investigated. The Geological Survey maps are valuable as far as they go, but frequently when preparing water schemes for the consideration of Parliament it is found necessary to obtain the requisite geological information by special and private survey, whereas so far as correct maps are concerned they ought to be available at any time at a reasonable cost. It is probable that most of the material necessary for the completion of the Geological Survey on a scale of 6 inches to the mile is practically now available, but the maps are not published for the reason probably that the Government Departments consider that there is not sufficient demand for them, and that therefore they might be published at a loss. The 1-inch maps are being issued at a largely increased price, and thus the cost of obtaining such information as exists, and which should be available for, and in the possession of, every water authority, is increased.

Supplies of any magnitude from surface sources are becoming difficult to obtain, except at very great cost, and in many areas dependent upon underground sources it is becoming difficult to obtain sites for wells, except at the risk of encroaching on existing public or private supplies.

Possibly the ultimate solution of these difficulties may come through a combination of authorities, who will be able to afford to go to considerable distances if necessary in order to obtain supplies for their districts, and to obtain and undertake the preparation of the necessary information with regard to rainfall, geological conditions, and the ascertainment of the level of underground waters over large areas in a manner that possibly no single authority could afford to do.

* An address delivered on September 7, before the engineering and architecture section of the Royal Sanitary Institute Congress at Brighton, by Mr. Henry Rofe, M.Inst.C.E., F.G.S., President of the section.

L.C.C. SCHOOL OF BUILDING, BRIXTON.

A COURSE of lectures on reinforced concrete, by Mr. H. Kempton Dyson, secretary of the Concrete Institute, has been arranged on Tuesdays and Fridays for next session at the above school.

This course will provide instruction in both the practice and theory of reinforced concrete construction. The course will be divided into two sections, the first being devoted to lectures on construction of reinforced concrete, the quantities for same, and workshop and laboratory practice, and the second to lectures on theory and design of reinforced concrete. Architects, surveyors, engineers, and others who desire to take the full course must show evidence that they possess an ordinary working knowledge of algebra, trigonometry and graphics (such as can be obtained from the classes on practical mathematics at the School of Building) and must have been instructed in structural mechanics, or must attend concurrently with this course the lectures on mechanics of building and strength of materials at the school Those desirous of studying only the practical side of the subject, such as builders, clerks of works, foremen and others, will be required to attend the lectures and practice in the first division above referred to.

The lectures on construction and quantities will deal with the history and development of reinforced concrete, materials, tools and appliances, making of concrete, and manufacture of reinforcing steel, centering, the actual work of construction, architectural treatment and finishings, quantity taking and estimating.

The lectures on theory and design will deal with the elasticity of the materials, experimental data, bending moments, shear stresses, beams, slabs, walls, columns, arches and domes, chimneys, reservoirs, tanks, bins, caissons, retaining walls, dams, pipes, sleepers, fence posts, poles, temperature stresses, rules and regulations, and practice in design.

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The workshop and laboratory practice is intended to supplement the lectures on practice and theory, and will deal with cement, its properties and testing, properties of stones and other aggregates, sand, water, steel, concrete proportioning and making, steel manipulation, making of centering and moulds, tests of structural members of reinforced concrete, the making of which affords practice in construction, bending moments, shear, adhesion, &c.

The course will be amplified by experiments, diagrams, lantern slides, specimens, models and the use of testing plant.

An endeavour will be made to visit works in course of construction in order to acquaint students with actual working conditions.

Fee for the course:—For those earning over 30*s.* a week, 10*s.* for the session; for those earning 30*s.* or less per week, 4*s.* 6*d.* the session; apprentices, learners and improvers under twenty-one years of age are admitted free. The sessional fee covers the whole or any of the classes in every subject held at the School of Building.

A special lecture on "The History and Development of Reinforced Concrete" will be delivered at the school by Mr. H. Kempton Dyson, C.E., on Tuesday, September 27, at 7.30 P.M. This lecture (which will be illustrated by the lantern), although complete in itself, is introductory to the above course. Admission to it will be free to all students and their friends.

Further particulars can be obtained from the Secretary of the London County Council School of Building, Ferndale Road, Brixton, S.W.

COLLAPSE OF SPRINKLER TANK SUPPORTS.

A REPORT on the collapse of the supports of a sprinkler tank located on the roof of a seven-storey reinforced-concrete building in Chicago has recently been made by Mr. F. H. Rice, of the Chicago Board of Underwriters. The following is an abstract of the report:—

The building is of reinforced-concrete construction, basement and seven storeys in height, located on the north-east corner of Michigan Avenue and Twenty-first Street. It had just been completed. The column centres are practically 24 feet apart each way. The columns are of structural steel. The typical girders are 12 inches thick below floor line, and 6 feet wide, running in each direction on column lines, while the floor slabs are only 6 inches thick. The building was designed to carry a load of 100 lb. per square foot, and had been tested at 300 lb. per square foot with a deflection of only 0.32 inches, or only about one-half that permitted for the 200-lb. test required by the city ordinance.

A sprinkler equipment had been installed and placed in full service about thirty days previous to the accident. The water supplies consisted of a gravity tank of 18,000 gallons capacity and a pressure tank of 4,000 gallons capacity. The gravity tank, which was of wood, was supported 25 feet 6 inches above the roof on the north-west corner of the building. The tank rested on I-beams laid on the upper chords of two diagonal steel trusses in the form of a cross, which were carried on three outside wall columns and one inside column. These columns were 13 feet 9 inches high, and were built of four 4 by 3-inch 9.3 lb. T's, with 6 by 3 by $\frac{3}{8}$-inch batten plates, spaced 1 foot 9 inches apart. Spliced connections were made to the seven-storey building columns, which were of similar construction, and were designed as reinforced-concrete columns. Flat bearing-plates for the trusses were provided at the top of the tank columns, these plates being rivetted to the trusses and to each member of the columns with a 4-inch section of 6 by 4 by $\frac{3}{8}$-inch angle-iron. The columns were not encased in concrete above the roof, but were covered with brick laid in common mortar and were filled in between with 12-inch brick walls forming the pressure tank-house. This house had a 4½-inch reinforced-concrete roof at the level of the lower chord of the trusses. Tie rods 1 inch in diameter were used at the top as the only bracing between the columns. The pressure tank was hung 3 feet 6 inches above the roof in two 1½-inch square iron U-hangers fastened to the lower chords of the trusses.

The collapse occurred about 3.20 P.M. on Sunday, May 22, when the building was closed. As far as can be learned, it was actually witnessed by but one person—a woman who happened to be standing at a window in one of the upper floors of an apartment building directly across the street. On that day the weather was cloudy, with light to brisk winds, recorded by the Weather Bureau as follows:—

10 A.M. to 12 M. .	. S.E., 5 miles per hour.
12 M. to 1 P.M. .	. S., changeable, 12 miles per hour.
1 P.M. to 2 P.M. .	. S.W., 15 miles per hour.
2 P.M. to 3 P.M. .	. E. to N.E., 8 miles per hour.
3 P.M. to 4 P.M. .	. N., 16 miles per hour.

There had been no strong winds during the previous twenty-four hours. There was rain about an hour before and an hour after the accident, but no lightning until about 4.47 P.M.

The structure fell toward the south with a lurch to the south-west as the great weight gained momentum, striking the roof and parapet wall with a tremendous crash. The gravity tank was crushed flat as it fell on its side on the roof, and the staves were torn from the bottom and lay in a loose pile within the hoops, none of which were broken. The bottom lay almost intact on the mass of twisted steel beams which had formed the platform. As the tank fell, the water, apparently in an almost solid mass, struck the roof at a point about 30 feet south, where the gravel composition roof was torn from the concrete, and rushing on, swept about 25 feet of the 5-foot parapet wall, with its heavy stone coping, at the south-west corner of the building, clean off into the street below. A considerable portion of the west parapet wall was also broken off. Masses of brick from the pressure tank-house walls fell to the west, damaging the roof of a two-storey flat building and slightly injuring two persons. The roof of a stable on the north was crushed in and several horses narrowly escaped being hurt. Three of the supporting columns were left standing, while the south-west column was found overhanging the west wall, held by a single splice-plate at its feet. While the framed beam platform, on which the gravity tank rested, was found almost intact, the trusses were twisted and bent so as to be almost unrecognisable.

The pressure tank falling with the structure, although supported only about 4 feet above, struck the roof slab with sufficient force to penetrate it and extend 3 feet into the top storey. The U-hangers, in which the tank was hung, were not fractured. The pipe connections were torn off as though made of paper, and the water from the pressure tank was thrown into the building.

Mr. Rice says the damage to the building, aside from the tank-house and structure, was only nominal, as the floor slab in only one unit and one of the outside roof girders needed to be replaced. With a building of wooden interior construction, it is more than likely that both tanks would have cut their way through to the basement, as has occurred in other cases.

The total damage to the building is roughly estimated at $2,500, and to the contents about $2,000; the adjacent property was damaged to the extent of about $2.500.

There appears to be no well-proved ground for complaint of negligence on the part of anyone, according to the report, as the plans for the supports, which were prepared by the architect, had been approved by consulting engineers and the city building commission, whose inspector certified to the structure after it was erected. The sprinkler contractor had accordingly been authorised by the architect to fill the tanks.

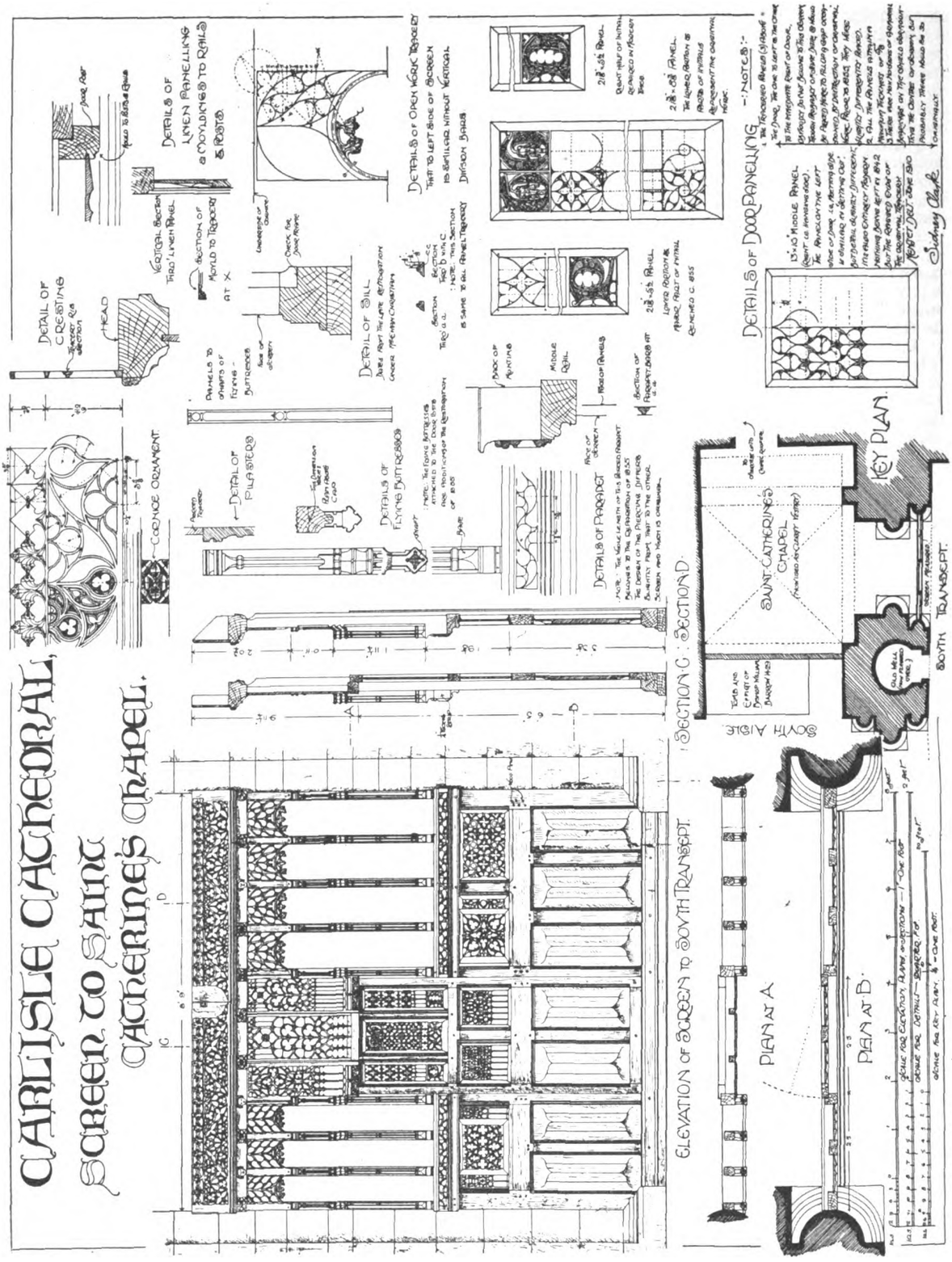
The exact cause of the collapse has not been definitely assigned, although very careful examinations were made of the material afterward by those concerned in its construction. It is believed, however, Mr. Rice states, that the following were contributing factors:—(1) Tank columns not encased in concrete, (2) lack of substantial steel bracing between the columns, (3) comparatively light connections of high-carbon steel at top of tank-columns, (4) possible effect of rather sudden shifting of the wind.

The lesson to be learned from this experience and from that other far less fortunate case in Montreal, according to the report, is, in general, the necessity for extreme care and conservative practice in the design, construction and maintenance of supports for great concentrated weights, such as are usually necessary for water supplies to automatic sprinklers. Mr. Rice ventures to suggest that the placing of such large quantities of water at high elevations may, after all, be a rather crude method, and that perhaps the future will develop a method of water supply to sprinkler equipments which will come to be considered as acceptable, if not so fully reliable, as a gravity supply.

GATESHEAD TOWN COUNCIL on Wednesday finally approved of plans for the new asylum it is proposed to erect at West Duddo, Northumberland, and agreed to apply to the Local Government Board for leave to borrow 114,000*l.* for its construction.

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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.



SCREEN TO ST. CATHERINE'S CHAPEL, CARLISLE CATHEDRAL.

THE gracefully designed oak screenwork here illustrated forms the division between the south transept and St. Catherine's Chapel. This chantry was founded, probably in the latter part of the thirteenth century, as its architectural features would lead us to beliève, by John de Capella, a wealthy citizen, and endowed by him with certain rents, lands, and burgage houses.—"History of Carlisle." The chapel now serves as a vestry for the clergy.

The ancient part of the screen is attributed to Prior Thomas Gondibour, and therefore dates circa 1490. Gondibour, who held his office from 1484 to 1507, appears to have been a very zealous worker in the cause of beautifying the church. Though assigned to this date the design of the screen is characteristic of the Flowing rather than of the Perpendicular period. Mr. Francis Bond in "Screens and Galleries in English Churches," is agreed that this example and the other between the chapel and the south aisle are French Flamboyant in feeling.

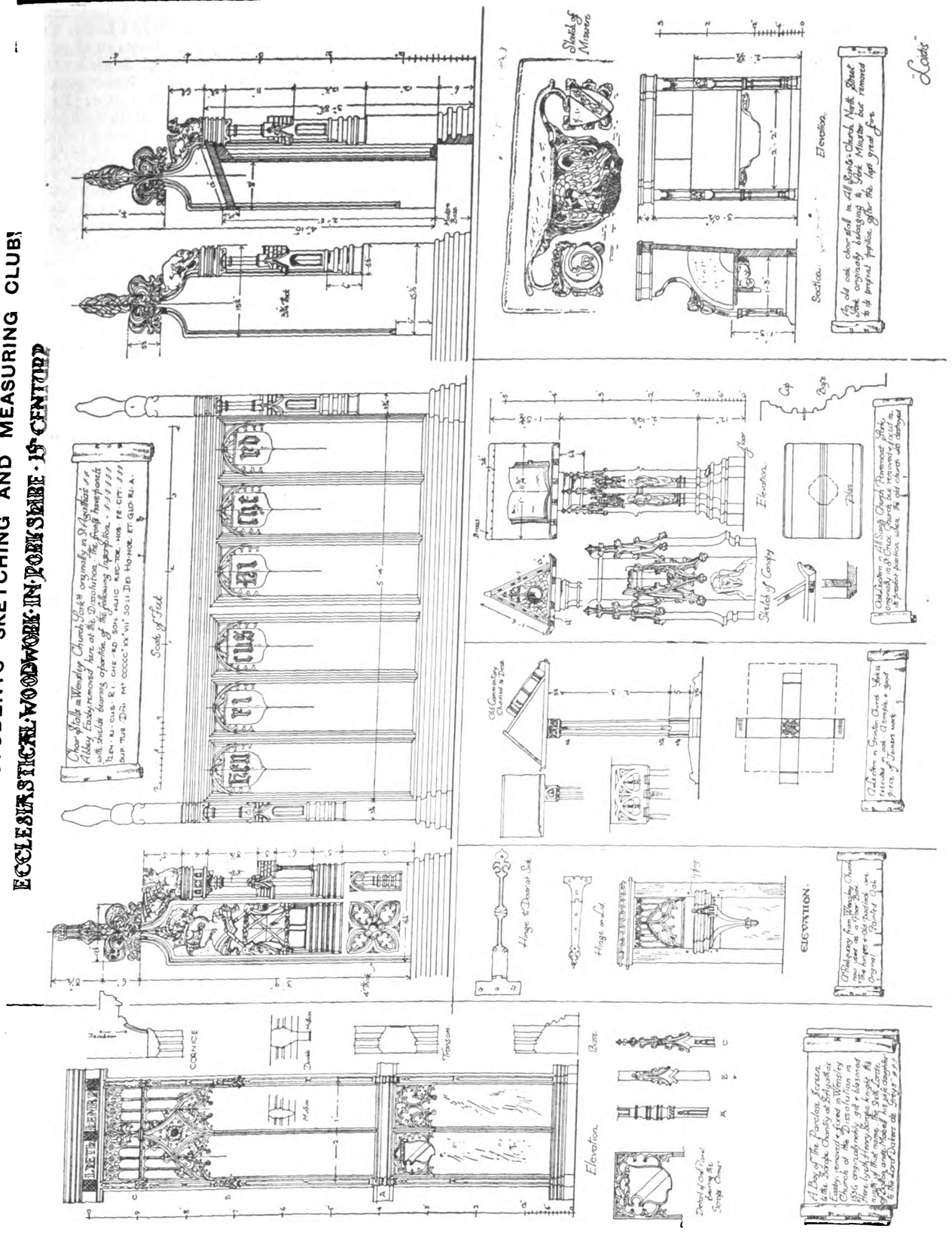
In 1764, during the episcopate of Bishop Lyttleton, the church was restored. The whole of the choir screens (also assigned to Gondibour) were removed to some of the outbuildings, and by far the greater portion either lost or destroyed; some of the most beautiful of the traceried panels were broken up and altered to enrich the door of the choir near the bishop's throne, and some, it is said, were actually used for firewood. Fortunately the Chapel of St. Catherine was not considered worth beautifying. Three or four of the panels at present in the chapel belonged to the choir. The originals, most probably, from being more beautiful, were cut away; the ends of the original tracery being still left give very much the appearance of their having been taken to fit a particular piece of furniture.

The initials T. G., reputed to be those of Thomas Gondi-

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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

ECCLESIASTICAL WOODWORK IN YORKSHIRE: 15TH CENTURY.



bour, which were beautifully cut in the tracery of the upper centre panel of the doorway, were wantonly destroyed in the winter of 1839."—R. W. Billings, "Carlisle Cathedral," 1842.

In 1855 these two screens were repaired in the restoration work undertaken by Mr. Ewan Christian, with Mr. C. H. Purday as superintendent of the works.

It will be noted that many of the traceried panels in this screen were designed on the square divided into four parts each way, the centres of all the curves being worked upon the lines of these squares.

THE Kidderminster Town Council have by a majority approved a scheme for the provision of public baths at a cost of between 5,000*l.* and 6,000*l.*

ECCLESIASTICAL WOODWORK IN YORKSHIRE: FIFTEENTH CENTURY.

THE examples of fifteenth-century woodwork shown on the accompanying illustration are all from Yorkshire churches.

The screen from Wensley Church originally formed part of the parclose to the chantry of the Scrope family, at St. Agatha's Abbey, Eastby, and was removed to its present position at the dissolution of that monastery in 1536 A.D. It now forms part of the family pew of the lord of the manor (Lord Bolton), and is in rather a dilapidated condition, and has been painted and "marbled" to match the rest of the woodwork, which is of seventeenth-century date.

The screen was originally richly decorated with paint and gold, and emblazoned with the arms and alliances of the Scrope family. The screen is of oak, and the detail is very

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delicate and refined, but the construction is rather poor, crockets, buttresses, finials, &c., being planted in; the upper part of the cornice is of seventeenth-century date.

The choir stalls in the church came from the same abbey. They have lately been restored and rearranged by Mr. Hodgson Fowler, of Durham. The seats, base, and part of the back are modern. The poppy heads are finely carved, and on the curved ramp just below the scrolls are heraldic and grotesque beasts. Commencing from the south-east they consist of (1) a wyvern, (2) bear, (3) lion, (4) griffin, (5) hare, (6) unicorn chained. Two bench ends have achievements, (1) (drawn) the arms of Scrope and Tiptoft, with helm having open bars and two Cornish choughs as supporters; (2) (not drawn), Scrope and Tiptoft, quarterly impaling Dacre and Warren, and underneath the initials H. R. (Henry Richardson, one time abbot).

The fronts are divided into panels each bearing a shield with a portion of the following inscription cut in letters of excellent character:—HEN. RI. CVS. RI. CHE. RD. SON. HUIC. REC. TOR. HOS. FE. CIT. SUP. TUS. DNI. M. CCCCC. XX. VII. SO. LI. DEI. HO. NOR. ET. GLORI. A.

The whole detail is vigorous and extremely well carved, the poppy heads, animals, and letters especially so, the canopy work and the quatrefoil at the bottom of the left hand bench end being a little coarser.

The carved oak reliquary evidently came from Easby with the other woodwork; it is now used as a poor box. The hinges and old lock are original.

The oak lectern is from Grinton Church, Swaledale, and is a simple and effective piece of joinery; the sunk tracery cap is especially charming and the slightly tapering stalk grooved with gouge channels, the shaped feet and moulded base block are wooden in character.

The lectern from All Saints Church, Pavement, York, is a more elaborate example. It originally was in the old church of St. Crux, which was criminally destroyed about sixteen years ago. The carving is excellent, especially the canopy work over the figures; the capping to the book rest is of hammered brass. The top swivels round on a pivot, and the hole in the spandril face is to gain access to it.

The moulded base, which is hard in outline and workmanship, is modern.

The oak choir stall from All Saints Church, North Street, York, came from York Minster after the last fire. The carved misericorde depicts the pelican feeding its young with its own blood, typical of the English Church. It is a vigorous piece of carving, rather coarse in character.

The lettering of the title in the drawing is founded on the carved wood inscription on the Scrope parclose screen.

THE SANITARY EXHIBITION AT BRIGHTON.

IN a leading article we deal with the important Health Exhibition organised by the Royal Sanitary Institute in connection with their twenty-fifth annual conference, and which will remain open until September 14. The following is the full list of awards:—

SILVER MEDAL.

THE EAGLE RANGE AND GAS STOVE CO., LTD.—Eagle Range. THE BRIGHTON AND HOVE GENERAL GAS CO.—Gas-heated Confectioner's Oven. BRITISH SANITARY CO.—Self-acting Earth Closet. THE CANDY FILTER CO., LTD.—Candy Filter for Ferruginous and Moorland Waters. CLAYTON & CO., LTD.—Motor Ambulance. ARTHUR H. COX & CO., LTD.—Pharmaceutical Preparations. R. FRY & CO., LTD.—Aerated Waters made in Brighton. GODDARD, MASSEY & WARNER, LTD.—Steam Disinfector, Improved Type THE HORSFALL DESTRUCTOR CO., LTD.—Refuse Destructor, with Tub Feed. THE "INTEROVEN" STOVE CO.—Combined Sitting-room Stove and Cooking Range. THE METAL JOINTING CO., LTD.—Amalgaline Metal Jointing. PACKHAM & SON.—The K.B. Kitchener. J. F. PHILLIPS & SON.—21 Old Queen Street, Westminster. Cable System of Heating. SUSSEX PORTLAND CEMENT CO., LTD.—Educational Value of Cement Exhibit. ARTHUR SKEFFINGTON. — Recumbent-Invalid Lifter. THE TINTOMETER, LTD.—Lovibond's Colour Educator.

BRONZE MEDAL.

THE BRIGHTON AND HOVE GENERAL GAS CO.—Gas-heated Garage Boiler. THE BRIGHTON AND HOVE GENERAL GAS CO.—"Thermo" Fire Front. BRISTOWE & CO., LTD.—Robbins' Non-set Plastic Cement. BRISTOWE & CO., LTD.—Vertical Bath. CAKEBREAD, ROBEY & CO.—Magnet Lockfast Joint. CAKEBREAD, ROBEY & CO.—Stevens's Barrel Locks. CARTER & CO., LTD.—Leadless Glaze Ware. EDWARD COOK & CO., LTD.—Cofectant, Surgical and Medical. JOHN EVERSHED & SON.—Household and Laundry Soaps. EXECUTORS OF THE LATE WILLIAM SHARRATT.—Compact Fumigator. EXECUTORS OF THE LATE WILLIAM SHARRATT.—Formalide Sprayer. JOHN GILKES & SONS, LTD.—Tekko. JOHN GILKES & SONS, LTD.—Birge Leather Papers. WALTER GILLETT.—Moore's Method of Indexing and Fileing.—THE HORSFALL DESTRUCTOR CO., LTD.—Low Loading Tipping Van. GEORGE HOWSON & SONS, LTD.—Westwood Range of Urinals. GEORGE HOWSON & SONS, LTD.—Bracket Lavatory in White Porcelain. GEORGE HOWSON & SONS, LTD.—Combination Hospital Bed-pan Sink. GEORGE HOWSON & SONS, LTD.—Westwood Bidet. WM. HARRIMAN & CO., LTD.—Newcastle-upon-Tyne. Stoneware Trap. G. JENNINGS, LTD., Lambeth Palace Road, S.E.—Hydro-Pneumatic Siphonic W.C Suite. LIBRARY BUREAU, LTD.—Card System of Registration. H. LOWRY, LTD.—Cobra Drain Cleanser. McDOUGALL BROS.—M.O.H. Disinfecting Fluid. MOULE'S PATENT EARTH CLOSET CO., LTD.—Earth Closet, with Chucker Action. NEWTON, CHAMBERS & CO., LTD.—Izal Disinfectant Fluid. THOMAS PARSONS & SONS.—Sanitary Enamels. RONUK, LTD.—Floor-polishing Brushes. "SANITAS" CO., LTD.—"Sanitas" Bactox. J. J. G. SAUNDERS & SONS.—Drainer and Slop Sink. J. J. G. SAUNDERS & SONS.—Bath and Shower. SHELVEY & CO., LTD., 1A Paston Place, Brighton.—Mineral Waters made in Brighton. WALTER WILLIAM SMITH.—Cantilever Sink Trap. WALTER WILLIAM SMITH.—Combined Copper and Bath Installation. SOUTHALL BROS. & BARCLAY, LTD.—Sanitary Towels. SPENCER HEATH & GEORGE, LTD., 48 and 52 Goswell Road, E.C.—Educational (Athletic) Diagrams. STANDARD RANGE AND FOUNDRY CO., LTD.—Motor Garage Hot Water Boiler. STANDARD RANGE AND FOUNDRY CO., LTD.—Improved Municipal Combination Heating and Cooking Stove. STANDARD RANGE AND FOUNDRY CO., LTD.—Birkone Patent Barless Fire. THE TINTOMETER, LTD.—Apparatus for Quantitative Determination of Colour Blindness. JOHN TYLOR & SONS, LTD.—"Manor" Pedestal Valve Closet. JOHN TYLOR & SONS, LTD.—"Regal" Silent Cistern. JOHN TYLOR & SONS, LTD.—Trough Lavatories. VIROL, LTD.—Virol.

DEFERRED FOR FURTHER CONSIDERATION.

ROYLE'S, LTD.—Row's Bath-Water Purification System. THE LIMMER ASPHALTE PAVING CO.—"Lithofalt," "Lithomac." EDWARD COOK & CO., LTD.—"Cofectant" Powder. GODDARD, MASSEY & WARNER.—Refuse Paving Block. LONDON WARMING AND VENTILATING CO., LTD.—Anthracite Slow Combustion Stoves. THE FERRYBRIDGE FOUNDRY CO., LTD.—Warming and Ventilating Stove.

THE Glasgow and West of Scotland Building Trades Employers' Council at their last meeting decided to write a protest to various local authorities who have adopted the method of scheduling the various departments of work in large contracts in one single schedule.

MR. C. E. E. CHILDERS, the British Vice-Consul at Pittsburg, reports the establishment there of a great national testing laboratory, under the direction of the United States Geological Survey at Washington. After maintaining limited test laboratories at other places, the Federal Government decided to consolidate them at Pittsburg, as being the most important manufacturing and coal-producing centre of the country, and 50,000*l.* was expended for the purchase of a site and erection of a plant. The dedication of the laboratory took place at the close of 1908, and during the past year tests and experiments have been continuously conducted, which are attracting the attention of the entire industrial world. The laboratory has also been engaged in the testing of the various materials used in building construction, such as coal, stone, cement, &c., and testing machinery has been erected for the determination in the most exact way of the tensile strength of iron and steel, one of these machines being capable of testing a resisting force of no less than 10,000 lb. It is believed that no such experiments of the resisting powers of metals have been made elsewhere in the world, and yet the machinery used is of the most simple character. It seems certain that the results of the work of this laboratory will tend greatly to the amelioration of modern industrial conditions, both in the direction of more economical and efficient production and in the safeguarding of the health and lives of the workmen.

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VARIETIES.

A MOVEMENT is being set on foot in Middlesbrough to provide for the erection of a picture gallery in memory of the late King Edward VII.

THE Oakwell Joint Hospital Board on Monday passed plans for extensions to the hospital, at an estimated cost of 6,500*l.*

THE late Canon Webb, for over thirty years vicar of St. Paul's, Crewe, has left a sum of 3,000*l.* for the erection of a permanent church to take the place of the existing St. Peter's Mission Church, Crewe.

IT is reported that a company with a capital of 100,000*l.* is being formed for the purpose of erecting an up-to-date café and arcade on the central beach at Blackpool, at an estimated cost of 40,000*l.*

COPIES of the booklet entitled "Cycling Spins in Beechy Bucks," which was noticed in our issue of August 26, may be obtained (post free for 3*d.*) from Publicity Department, Great Central Railway, 216 Marylebone Road, S.W.

MR. C. E. MERRALL, chief engineer of the Camberwell Infirmary, has been selected by the Southampton Board of Guardians to report to them the best system of heating to be adopted at the infirmary. If the system suggested be approved by the Local Government Board, Mr. C. E. Merrall will be appointed to prepare the specification and supervise the carrying out of the work at an inclusive fee of 110*l.*

THE Perth School Board at their last meeting agreed (1) to adapt the buildings of Sharp's Institution to serve as a preparatory school, and for a modified intermediate course providing industrial and commercial courses; and (2) to erect a new school on the site of the present Academy building to be used as a secondary school. The estimated cost of the scheme is 20,000*l.*

THE Engineering and Machinery Exhibition was opened at Olympia, London, by the Marquess of Graham, on September 1. This is the third of its kind held at Olympia since 1906, and the next one will take place in 1913. The present exhibition is regarded as a distinct advance on its forerunners. It will remain open until Monday, September 26, inclusive.

A LARGE extension has been completed to the Falkirk High School. The extension consists of a separate two-storey building situated at the corner of Rennie Street and Griffiths Street. On the ground floor there are two chemical laboratories and a spacious workshop for manual instruction. On the upper floor there is a nature-study laboratory for twenty-four pupils, and associated with it is a conservatory. On the upper floor to the north are also situated two well-lighted art rooms; the remainder of the floor is occupied by a gymnasium 50 feet in length and 35 feet in width. The building is estimated to cost over 6,000*l.*, and the architects were Messrs. A. & W. Black, Falkirk.

THE School of Art Wood-Carving, 39 Thurloe Place, South Kensington, which is under royal patronage, has been reopened after the usual summer vacation, and we are requested to state that some of the free studentships in the evening classes maintained by means of funds granted to the school by the London County Council are vacant. The day classes of the school are held from 10 to 1 and 2 to 5 on five days of the week, and from 10 to 1 on Saturdays. The evening class meets on three evenings a week and on Saturday afternoons. Forms of application for the free studentships and any further particulars relating to the school may be obtained from the Secretary.

BUILDERS intending to enter for the Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, Romford, 1911 (Class VII.), or intending to tender for the erection of competition houses, should send in their names at once to the Secretary, 33 Henrietta Street, Covent Garden, W.C. In Class VII. there will be a gold medal and 100*l.* given for excellence of workmanship and construction in the erection of a detached house to cost 500*l.*, or a detached cottage to cost 375*l.* The organisers also offer a second prize in the same class, amounting to 50*l.*

THE Co-Partnership Housing Council, in a statement as to the progress of the housing movement during the past half-dozen years, points out that the only co-partnership housing scheme in existence in 1903 was at Ealing, and the cash value of the land and buildings in the possession of the Ealing Tenants was 10,237*l.* Since that date thirteen other schemes have been started, there being three at Hampstead and one each at Garden City (Letchworth), Sevenoaks, Leicester, Manchester, Harborne, Fallings Park, Stoke-on-Trent, Derwentwater, and Sealand, the total area of land in the possession of these societies being 652 acres, on which it is intended to build in all 6,595 houses, at a total cost of 2,105,990*l.*, of which about one-fourth had been expended at the end of the last financial year. Two estates are practically completed—the one at Manchester and the earliest of the Hampstead schemes. The largest area of land owned by any one society is that of the Liverpool Tenants (which includes 185 acres of land provided by the Marquis of Salisbury), and on this area it is proposed to erect 1,000 houses.

A LOCAL GOVERNMENT BOARD Inquiry has been held by Mr. H. A. Reed, M.Inst.C.E., into an application of the Doncaster Rural District Council for sanction to a loan for works of sewerage and sewage disposal for the rapidly increasing districts of Owston and Skellow, where a large colliery is being constructed. The scheme, which has been designed by Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne, consists in the laying of several miles of main sewers of cast-iron and stoneware pipes surrounded by concrete, which will be conveyed to an underground pumping-station, where the sewage will be automatically pumped by electric motors driving centrifugal pumps to the site of the purification works. These works consist in treating the sewage in liquefying tanks and continuous sand filters, the effluent from which will be discharged into the Well Syke.

THE Homeland Association, Ltd., have issued a third edition of their reference book entitled "Where to Stay in the West Country" (cloth 1*s.*, paper 6*d.*), or rather of Vol. I., which deals with the section served by the London and South-Western Railway. Mr. Prescott Row, the editor, says the book was compiled with a view to giving information to possible permanent residents as well as to transient visitors; that is to say, it mentions details like rates, lighting and schools, in addition to the inevitable hotels. It is somewhat surprising to find that each place, whether great or small, has two pages of letterpress—no more, no less. This arrangement seems a little unfair, for it puts unimportant Port Isaac or Camelford on a level with Bath and Plymouth. Presumably the reason is that the Homeland Association have already published separate handbooks or handy guides for the important places. The Association have done a real public service in preparing these guides, and thereby revealing to numbers of people what a rich and inspiring country lies at their door.

THE Town Planning and Modern House and Cottage Exhibition to be held at Squirrels Heath in 1911 is, we understand, attracting a very satisfactory number of entries. Garden Suburb development has opened up a new field of work for architects. At Hampstead nearly 400,000*l.* worth of work in the form of cottages and small houses, erected in the last three years, have all been separately designed, and their erection supervised, by well-known architects. A few years ago 90 per cent. of this work would have been carried out with the very minimum of professional assistance and no supervision. The encouragement which this exhibition must give to the employment of the best architectural skill in building the small houses of which London suburbs are mainly composed, and with which architects have hitherto had little to do, deserves recognition by the profession, and it is to be hoped that some of our leading architects will give their assistance to make the Exhibition thoroughly representative of the best domestic work of to-day.

TRADE NOTES.

COWELL'S sanatorium air brick or ventilator has been selected for outside "Ideal Homes." The sole owner of the patent is Mr. E. Cowell, Churchtown, Southport.

MESSRS. VINCENT ROBERTS & MARR, LTD., heating engineers, of Cherry Row, Leeds, having by the increase in their business been compelled to take much larger and more commodious premises, desire us to announce that their address from September 12 will be Charmouth Street, Leeds.

A LARGE clock has lately been erected at Wilden, near Stourport, as a memorial to the late Mr. Baldwin. It has three dials and strikes the hours. The work has been carried out by Messrs. John Smith & Sons, Midland Clock Works, Derby, who have recently fixed clocks in the neighbourhood at Astley Hall and Martley Church.

MESSRS. E. H. SHORLAND & BROTHER, LTD., of Failsworth, Manchester, have just supplied their warm air ventilating patent Manchester grates to All Saints' Institute, Southampton. The Padiham gas department new offices and workshops are being ventilated by means of Shorland's patent exhaust roof ventilators and special inlet ventilators; and Shorland's Manchester stoves are being supplied to the Reston school, N.B., and to the Coldingham schools, N.B.

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Highest Award, Silver Medal,
Health Exhibition, 1910
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Cathedrals and Abbeys of England—continued.

WELLS.

Nave looking East	October 13, 1899
West Front	October 20, 1899
Detail of Front and West Door	October 20, 1899
Looking North-West from Wells	October 27, 1899
Choir looking East	October 27, 1899
North Porch and Tower	November 3, 1899
From Lady Chapel looking West	November 3, 1899
Looking North-East from Burial-ground	November 10, 1899
Details North Porch	November 10, 1899
Hugh Lugar's Chantry and South Aisle	November 17, 1899
The Triforium	November 24, 1899
The Lady Chapel	December 1, 1899
Bishop Bubwith's Chantry	December 8, 1899
Clock in North Transept	December 8, 1899
Steps to Chapter-house and Bridge	December 15, 1899
Tomb of Henry Husse, Dean 1302-05	December 15, 1899
Doorway, Chapter-house	December 22, 1899
View of Chapter-house, looking North-West	December 22, 1899
Section of Chapter-house	December 22, 1899
Bridge to Vicars Close	December 29, 1899

WESTMINSTER ABBEY.

Sixty Years Ago	January 5, 1900
Choir, looking East, Part North Transept	January 5, 1900
Entrance South Ambulatory	January 5, 1900
Triforium, North Transept	January 5, 1900
Tower and Buttresses from Cloisters	January 12, 1900
The Triforium	January 12, 1900
Choir looking East, Part South Transept	January 19, 1900
North Door	January 19, 1900
Transept looking North-East	January 26, 1900
Triforium, North Side of Sacrarium	January 26, 1900
Details North Porch	January 26, 1900
From South Transept looking North-East	February 2, 1900
North Ambulatory looking towards Henry VII.'s Chapel	February 2, 1900
Poets' Corner	February 2, 1900
Triforium, South Transept	February 9, 1900
North Side of Cloisters	February 9, 1900
Part Old Arcade, Chapel St. Edmund	February 9, 1900
Interior looking East Modern Screen	February 16, 1900
Details North Porch	February 16, 1900
South Ambulatory looking towards Henry VII.'s Chapel	February 23, 1900
North Ambulatory looking East	February 23, 1900
Abbot's Courtyard	February 23, 1900
Deanery and Corner of Cloisters	February 23, 1900
Bishop Islip's Chantry in North Ambulatory	March 2, 1900
Monks' Common Room	March 2, 1900
Crypt under Chapter-house	March 2, 1900
Chapel of St. Edmund, looking North-East	March 9, 1900
Entrance to Cloisters looking Dean's Yard	March 9, 1900
Tomb of Edward III.	March 9, 1900
Chapel St. John Baptist	March 16, 1900
View showing Porch	March 16, 1900
Bronze Gates	March 16, 1900
Cloisters and End South Transept	March 23, 1900
Entrance to Chapter-house	March 23, 1900
Shakespeare Memorial	March 23, 1900
Ambulatory to Henry VII.'s Chapel	March 30 1900
Doorway in Chapter-house	March 30, 1000
Arcade in Chapter-house	March 30, 1900
Chapel of St. Nicholas	April 6, 1900
Reredos from Confessor's Chapel	April 6, 1900
North Side, Confessor's Tomb	April 13, 1900
Abbot's Pew	April 13, 1900
North-East Side Confessor's Tomb	April 13, 1900
Chapel St. Edmund, looking North-West	April 20, 1900
Chapel of Pyx	April 20, 1900
Entrance to Little Cloister	April 20, 1900
Modern Reredos	April 27, 1900
Doors of Chamber of Pyx	April 27, 1900
Ancient Norman Capital	April 27, 1900
Tombs in Sacrarium	May 4, 1900
Gateway to Chapter-house	May 4, 1900
East Cloisters	May 4, 1900
Triforium, North Transept	May 11, 1900
End of Tomb of Henry VII.	May 11, 1900
Confessor's Shrine from North-West	May 11, 1900
Henry V.'s Chantry	May 18, 1900
Details	May 18, 1900
Tomb, Henry VII. and Queen Elizabeth	May 18, 1900
From Playground	May 25, 1900
Showing Tower and Roadway	May 25, 1900
Details of Stalls	June 1, 1900
Exterior	June 1, 1900
South Aisle	June 8, 1900
South Aisle looking West	June 8, 1900
Henry VII.'s Tomb	June 15, 1900
Henry VII.'s Tomb nd Chapel	June 15, 1900
Monuments of Duc de Montpensier	June 22, 1900
Showing Pendentive, &c.	June 22, 1900
Corner of Little Cloisters	June 29, 1900
Jerusalem Chamber	June 29, 1900
Figure, Mary Queen of Scots	June 29, 1900
Wilberforce Monument	June 29, 1900
Ground Plan	June 29, 1900

LICHFIELD.

Choir looking West	July 6, 1900
Nave looking East	July 13, 1900
West Doorway	July 20, 1900
View from West	August 10, 1900
West Front	August 17, 1900
Part Lady Chapel	August 24, 1900
South Door	August 31 1900
East End	August 31, 1900
North Transept Door	August 31, 1900
Portion of West Front	September 7, 1900
North Side of Nave	September 14, 1900
From Cathedral Close	September 21, 1900
Choir and Reredos	September 21, 1900
South Side of Nave and South Transept	September 21, 1900
Lady Chapel	September 28, 1900
From Minster Roof	October 5, 1900
South Choir Aisle	October 12, 1900
Showing Minstrel Gallery	October 19, 1900
Entrance to Chapter-house	November 2, 1900
The Reredos	November 30, 1900
The Transepts, looking North	December 7, 1900
North Nave Aisle, looking East	December 14, 1900
Detail of Corner of Front	December 14, 1900
One of the smaller West Doors	December 14, 1900
The Chapter-house Entrance	December 28, 1900
The Chapter-house Passage	December 28 1900
View in South Transept	December 28, 1900
Looking to Nave	December 28, 1900
Ground Plan	December 28, 1900

YORK.

General View of Exterior from South-East	January 4, 1901
General View from North-west	January 11, 1901
Detail of South-west end of Front	February 1, 1901
The Nave, to Organ Screen	February 8, 1901
View in North Transept, showing Clock and Triforium Windows	February 15, 1901
The Choir, half-length	February 22, 1901
From South-West	March 1, 1901
South Nave Aisle, looking East	March 8, 1901
South Choir Aisle, looking West	March 15, 1901
Entrance to the South Choir Aisle	March 22, 1901
The Choir to Organ Screen	March 29, 1901
The Great Stone Screen	April 5, 1901
View across Nave to North Transept	April 5, 1901
Detail of Nave Arches	April 12, 1901
Detail of Arcading under West Window	April 12, 1901
The Choir, full length to East Window	April 19, 1901
The Lady Chapel	April 26, 1901
Cross View to Nave from South Transept	May 3, 1901
View across Nave to South Transept, showing Font	May 10, 1901
The South Door	May 10, 1901
West End of Nave	May 17, 1901
West End of South Nave Aisle	May 31, 1901
South Choir Aisle, half length	June 7, 1901
The Chapter-house	June 21, 1901
The Chapter-house Door	June 28, 1901
Details in Chapter-house	June 28, 1901

CHICHESTER.

From St. Richard's Walk	July 5, 1901
The Screen and Choir	July 12, 1901
View from North-East	July 19, 1901
South Transept	July 26, 1901
Triforium, South-West Tower	August 2, 1901
Looking up the South-West Tower	August 2, 1901
Window Tracery, South Transept and Lady Chapel	August 9, 1901
Capitals, South Choir Aisle	August 16, 1901
Inside the Triforium looking West	August 23, 1901
South-West corner of Nave	August 30, 1901
East End of North Aisle	September 6, 1901
East Cloister and South Aisle	September 13, 1901
North Aisle, Looking West	September 20, 1901
Tower and South Transept	September 27, 1901
Ancient Sculpture in Wall of South Choir Aisle	October 4, 1901
The Raising of Lazarus	October 4, 1901
East End of Retro-Choir	October 18, 1901
The Lady Chapel	October 18, 1901
Cloisters and South-west Tower	October 18, 1901
Tower and East End of Choir	October 25, 1901
Triforium, North-east Corner of Retro-Choir	October 25, 1901
Chapel of St. Clement	November 1, 1901
Looking into South Aisle of Nave	November 1, 1901
One Bay of Nave Triforium	November 1, 1901
North Transep and Campanile	November 15, 1901
South Door in Cloisters	November 15, 1901
East End of South Cloister	November 15, 1901
Triforium, &c., from West Window	November 22, 1901
West End of South Aisle	November 22, 1901
The Reredos	November 29, 1901
The Library	November 29, 1901
East End of Lady Chapel	December 6, 1901
West End of Lady Chapel	December 6, 1901
The Nave	December 13, 1901
Nave Arches	December 13, 1901

RIPON.

General View of Exterior from South-East	January 3, 1902
The Choir to East Window	January 17, 1902
The Nave, looking West	January 31, 1902
General View, from the River	February 14, 1902
The Three Stone Sedilia	March 7, 1902
The Rood-Screen between Nave and Choir	March 28, 1902

RIPON—*continued.*

The South Nave Aisle, looking East	April 4, 1902
he Choir, looking West	April 18, 1902
View of the South Side of Nave	May 2, 1902
North Side of the Nave, showing Double Buttresses	May 2, 1902
General View of Nave to Organ Screen	May 16, 1902
Portion of North Transept, showing Old Stone Pulpit	June 6, 1902
The South Transept	June 6, 1902
The West Front	June 13, 1902
The West Entrance	June 13, 1902
South Choir Aisle, looking West	June 27, 1902

HEREFORD.

View from North-West	July 4, 1902
View from South-East	July 11, 1902
View from North-East	July 18, 1902
Nave Arches, North Side	July 25, 1902
South Aisle, looking East	August 1, 1902
From South Aisle, looking into North Transept	August 1, 1902
East End	August 8, 1902
South Side of Lady Chapel	August 8, 1902
North Porch	August 15, 1902
South Transept and Cloisters	August 15, 1902
The Nave	August 22, 1902
East End of South Choir Aisle	September 5, 1902
The High Altar	September 5, 1902
The Retro-Choir	September 19, 1902
In South-East Transept	September 19, 1902
The Choir Screen	October 10, 1902
From North Choir Aisle, looking South-East	October 17, 1902
The Cloisters and the Ladye Arbour	November 7, 1902
The Vicars' Cloisters	November 7, 1902
Looking into North Transept	November 14, 1902
East Wall of North Transept	November 21, 1902
The North Door	November 28, 1902
A Coffin Lid	November 28, 1902
East Wall of South Transept	December 5, 1902
Ball Flower Ornament on Tomb in North-East Transept	December 12, 1902
Four-Leaved Flower Ornament on Tomb in North noir Aisle	December 12, 1902
Corner of North Transept	December 19, 1902
Gargoyle in Cloisters	December 19, 1902
North Wall of Lady Chapel	December 26, 1902
Diaper Work and Capitals in North Transept	December 26, 1902

WORCESTER.

From North-East	January 2, 1903
The Choir, looking West	January 9, 1903
South Transept and Tower	January 16, 1903
Cloisters and Tower	January 23, 1903
The Nave	January 30, 1903
East End of Prince Arthur's Chantry. Details of Prince Arthur's Chantry	February 6, 1903
Looking North-West across the Nave	February 13, 1903
Entrance to Cloisters. Bosses in Cloister Vaulting	February 20, 1903
Capitals in South Transept. The Crypt	February 27, 1903
The High Altar	March 13, 1903
Nave Arches and North Transept	March 27, 1903
The West Door. The North Porch	April 10, 1903
From Lady Chapel, looking into South-East Transept	April 17, 1903
Chapel of St. John	May 1, 1903
Cloisters and South Transept	May 15, 1903
Looking into North Transept	May 29, 1903
South-East Transept	June 19, 1903
Looking into Lady Chapel	June 19, 1903
The Screen and Choir	June 19, 1903
North Cloister	June 26, 1903
The Chapter-House	June 26, 1903
South Door in Cloisters	June 26, 1903

EXETER.

The West Front	July 3, 1903
The Choir, looking East	July 10, 1903
The Choir Screen	July 17, 1903
The North Tower and North Porch	July 24, 1903
The Nave, looking West	July 31, 1903
Window Tracery, North and South Side of Choir	August 7, 1903
View from South-East	August 14, 1903
Details of West Front	August 21, 1903
Chapter-house and Cloisters. South Tower, from Palace Garden	September 4, 1903
Sylke's Chantry and Chapel of St. Paul	September 11, 1903
West End of Lady Chapel	September 25, 1903
South Aisle, looking East	October 9, 1903
South Aisle	October 16, 1903
Nave Vaulting	October 23, 1903
Speke Chantry, and Chapel of St. Mary Magdalene	October 30, 1903
St. Gabriel's Chapel and End of Bishop Oldham's Chantry	November 6, 1903
North Transept and Clock	November 13, 1903
Nave, looking East	November 20, 1903
The Nave Arches	November 27, 1903
Chancel, and Screen to North Aisle	December 4, 1903
East End of Lady Chapel	December 11, 1903
The Choir	December 18, 1903
High Altar and Sedilia	December 25, 1903

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Owing to the demand for the Cathedral and College Series, all Numbers previous to January 1910 are now charged at 6d. each.
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Architect and Contract Reporter.

FRIDAY, SEPTEMBER 16, 1910.

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South Africa: *Central News Agency, Ltd.*

NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

Antwerp.—Oct. 1.—An international competition is being arranged for a scheme for the laying out of the land surrounding Antwerp, which will shortly be available by the demolition of the encircling fortifications. Premiums of 1,000*l.*, 400*l.*, and 200*l.* are offered. Copies of the conditions, &c., may be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C., or, on payment of 100 francs from the "Commission d'études de l'aménagement de l'agglomération anversoise," 57 Rue du Jardin des Arbalétriers, Antwerp.

Brighton.—Oct. 1.—The Governors of the Brighton, Hove and Sussex Grammar School invite architects experienced in scholastic buildings to submit their names for a proposed limited competition. The Governors intend to erect new buildings at a cost of about 16,000*l.* Send names and particulars of buildings by Oct. 1 to Mr. A. F. Graves, clerk to the Governors, 9 North Street Quadrant, Brighton. (For further details see advertisement Sept. 16.)

Bournemouth.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

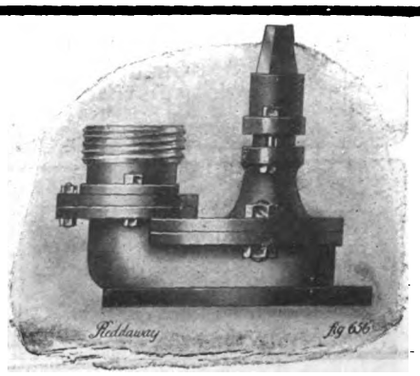
Ireland.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further



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particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

IRELAND.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

MANCHESTER.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

RUISLIP.—Nov. 15.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

WALES.—Sept. 19.—The town hall committee invite competitive designs, &c., for the proposed alterations and additions (not exceeding in cost 3,000*l.*) to the town hall and market hall, Maesteg. Conditions, with a plan of site and sections at ground level, may be obtained from Mr Samuel J. Harpur, engineer and surveyor, Town Hall, Maesteg. Two premiums are offered, namely, 25 guineas and 10 guineas, as first and second respectively. The committee do not bind themselves to award the premiums, and they do not intend to engage the authors of the designs for which premiums may be awarded to carry out or supervise the work.

WALES.—Oct. 1.—The Town Council of the borough of Denbigh invite competitive plans and designs of a public hall, markets, municipal buildings, &c., which it is proposed to erect at a cost not to exceed 10,000*l.* Three premiums are offered, viz. 75*l.*, 30*l.* and 20*l.*, as first, second and third respectively. Send 1*l.* 1*s.* deposit for particulars, &c., Mr. J. Parry Jones, town clerk, Denbigh.

CONTRACTS OPEN.

ANNFIELD PLAIN.—Sept. 19.—For erection of a picture theatre at Annfield Plain, Durham. Mr. L. H. Armour, 16 West Street, Gateshead.

BIRMINGHAM.—Sept. 22.—For the erection of a police station at the corner of Digbeth and Allison Streets. Send 2*l.* 2*s.* to the City Treasurer. Messrs. Mansell & Mansell, quantity surveyors, 47 Temple Row, Birmingham.

BIRMINGHAM.—Sept. 28.—For the erection of workshops, offices, &c., for the purposes of a lighting depôt, in Cambridge Street. Deposit 2*l.* Mr. Henry E. Stilgoe, M.I.C.E., city engineer and surveyor, Council House, Birmingham.

BOLTON-ON-DEARNE.—Sept. 23.—The West Riding education committee invite whole or separate tenders for the following work:—Bolton-on-Dearne Council school, erection of boundary walls (builder). The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

CASTLEFORD.—Sept. 21.—For removing gallery, fixing sliding partition, and other work at Allerton Bywater Council school, and for converting closets into water closets. Mr. B. Leah, Education Office, Castleford.

COVENTRY.—Sept. 17.—For the works required to be executed and materials supplied in the erection of a boundary wall and entrance gates at the destructor works, &c., Foleshill Road. Send 1*l.* deposit to the City Treasurer. Mr. J. E. Swindlehurst, city engineer and surveyor, St. Mary's Hall, Coventry.

DOUGLAS.—Oct. 1.—For new mission hall and Sunday school at St. Matthew's, Douglas, Isle of Man. The Rev. H. S. Taggart, M.A., St. Matthew's Vicarage, 2 Mount Havelock.

DUBLIN.—Sept. 23.—For erection of a fire brigade station, Thomas Street. The City Architect, Municipal Buildings, Cork Hill, Dublin.

DURHAM.—Sept. 23.—For new electric theatre, Claypath, Durham City. Forward names and 1*l.* 1*s.* deposit to Messrs. Henry Gibson & P. J. Stienlet, architects, 56 Camden Street, North Shields.

DURHAM.—Sept. 20.—The Durham County Council invite sole tenders for new Council schools at Mount Pleasant, Spennymoor, and Close House (near Bishop Auckland), manual instruction room at Ryhope, and alterations at Broompark Council school. (1) Mount Pleasant, Spennymoor (for about 350 scholars), Mr. W. Rushworth, Shire Hall, Durham. (2) Close House (for about 500 scholars), manual room at Ryhope, and alterations at Broompark. Mr. N. Richley, Shire Hall, Durham.

EAST RIDING.—Sept. 28.—The education committee invite tenders for the following:—(*a*) The erection of a school for 122 children and teachers' house at Luttons Ambo; (*b*) the erection of a school for 162 children at Sutton-on-Hull; and (*c*) boundary walls at Norton (Malton). Deposit 1*l.* 1*s.* in each case. The Building Surveyor, County Hall, Beverley.

ECCLESTON.—Sept. 24.—For erection of an elementary school at Eccleston, near St. Helens, to accommodate 170 scholars. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

HASLINGDEN.—Sept. 27.—For carrying out the following works, for the Guardians of Haslingden Union, viz.:—Supply and fixing of (1) iron balconies; (2) fire escape staircases; (3) wall tiling for bathrooms and corridors at the new infirmary, Higher Pike Law, Rawtenstall. Mr. Henry Ross, A.R.I.B.A., architect, 15 Cannon Street, Accrington. Apply to Mr. J. H. Sinkinson, clerk, Union Offices, Rawtenstall.

HULL.—Sept. 23.—For the construction of a removable wood dancing floor, for the new hall at Madeley Street Baths. Mr. A. E. White, M.I.C.E., city engineer, Town Hall, Hull.

HULL.—For all trades in connection with erection of electric theatre at Hull, for the National Electric Theatres, Ltd. Send names to Messrs. James Young & Co., architects, 62 Market Street, Bradford.

HURST (LANCS.).—Sept. 22.—For execution of the work of altering the Council offices and house in Lower King Street. Mr. Samuel Shirt, surveyor, Hurst.

IRELAND.—Sept. 19.—Tenders for erection of a Crown post-office at Roscommon. The Office of Public Works, Dublin, and the Post Office, Roscommon.

IRELAND.—Sept. 23.—For the erection of a new house in the Demesne, Lissadell, near Sligo, for Sir Josslyn Gore Booth, Bart. The Estate Office, Lissadell, or Mr. W. A. Scott, A.R.H.A., A.R.I.B.A., architect, 45 Mountjoy Square, Dublin.

IRELAND.—Sept. 24.—For erecting and fencing thirty-nine single cottages at Ballynahinch, Ballyrange, and Tullyboard, for the Rural District Council, at not more than 140*l.* each. Mr. R. L. Morrow, clerk to the Council, Downpatrick.

IRELAND.—Sept. 26.—For erection of a house at Cultra, Belfast. Messrs. Watt, Tulloch & Fitzsimons, architects, 77A Victoria Street, Belfast.

IRELAND.—Sept. 26.—For alterations to the Locomotive Engineer's Office, Dundalk, and raising the roof of the engine paint shop, Dundalk, and works in connection therewith, for the Great Northern Railway Co. (Ireland). Mr. T. Morrison, secretary, at Dublin or Belfast.

KEIGHLEY.—For alterations to retaining wall and railings, Municipal Institute Corner. The Borough Engineer, Town Hall, Keighley.

KINSALE (IRELAND).—Sept. 20.—For the erection of forty cottages, for the Kinsale Rural District Council. Mr. John Murphy, clerk, Workhouse, Kinsale.

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LEEDS.—Sept. 29.—For erection of a six-stalled brick urinal, to be built at the junction of Hunslet Road and Hunslet Lane. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

LONDON.—Sept. 20.—For alterations and additions to the laundry at Brentford Workhouse, Isleworth, W. Send 2*l.* 2*s.* to Mr. W. Stephens, clerk, Union Offices, Isleworth, W. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

LONDON.—Sept. 21.—For erection of stables at the Urban District Council River Depôt, Corney Reach, Chiswick, W. Mr. Edward Willis, A.M.I.C.E., surveyor, Town Hall, Chiswick, W.

LONDON.—Sept. 27.—For painting, cleansing, and repair of various public buildings, &c., for the West Ham Town Council. Deposit 1*l.* Mr. John G. Morley, borough engineer, Town Hall, West Ham, E.

MALTBY.—Sept. 23.—The West Riding Education Committee invite whole or separate tenders in connection with the Maltby new school, viz. builder, joiner, tiler, plumber, plasterer, painter, and asphalter. The Education Architect, County Hall, Wakefield. Send 1*l.* 1*s.* deposit to the West Riding Treasurer, County Hall, Wakefield.

MANCHESTER.—Sept. 23.—For the construction of a store cellar at the workhouse in Tame Street, Ancoats. Deposit 10*s.* 6*d.* Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

MARGATE.—Oct. 17.—For erection of a dust destructor. Mr. E. A. Borg, borough surveyor, 13 Grosvenor Place, Margate.

MIDDLESBROUGH.—Sept. 27.—For the whole of the works required in erection of new junior mixed and infants' schools and the alterations and additions to the existing schools in Roman Road, Linthorpe, Middlesbrough. Send names and 2*l.* 2*s.* deposit to Mr. James Forbes, architect, 43 Albert Road, Middlesbrough.

MIDDLESBROUGH.—For outdoor shelters and additions and alterations to receiving block at the Union Workhouse. Messrs. R. Lofthouse & Sons, architects, 129 Albert Road, Middlesbrough.

MONK BRETTON.—Sept. 21.—For the alteration of the present drainage system (trade, bricklayer) at Monk Bretton (Smithies) Council school, Yorks. Mr. T. Graham, West Riding Education Offices, Obelisk Chambers, Barnsley.

MORLEY.—Sept. 19.—For the mason and bricklayers', joiners', slaters', plasterers', and painters' works combined and plumbers' work required to be executed in erection of additions at the fever hospital in Bruntcliffe Lane. Mr. W. E. Putman, A.M.I.C.E., borough engineer and surveyor, Town Hall, Morley.

OCKFORD.—Sept. 20.—For erection of pumping station buildings at Ockford, near Godalming. Deposit 1*l.* 1*s.* Mr. J. H. Norris, borough surveyor and water engineer, Municipal Buildings, Godalming.

POOLE.—Sept. 26.—For the following work, for the Town Council:—Item (1), painting to the exterior of the Town Hall; (2) repairs to the interior of the old police station, Market Square; (3) erecting shed for fire escape at Branksome depot; (4) painting to exterior of Lodge, Parkstone Cemetery; (5) painting to exterior of Heatherlands school, Branksome Heath school, and Oakdale school; (6) provision of one single and one pair of wrought iron gates at Alderney Isolation Hospital. Mr. Samuel J. Newman, F.R.I.B.A., borough surveyor, Municipal Offices, Market Street, Poole.

ROYSTON.—Sept. 21.—For erection of a partition in the boys' department of Royston Council School, Yorks. Mr. T. Graham, Obelisk Chambers, Barnsley.

SCOTLAND.—Sept. 20.—For erection of four cottages for farm servants and four cottages for attendants at Bangour Village, Uphall. Messrs. Peter Lawrence & Co., surveyors, 50A Frederick Street, Edinburgh.

SCOTLAND.—Sept. 20.—For the mason, joiner, slater, plumber, and plasterer work of four new houses to be erected in Morebattle. Messrs. Main & Shanks, solicitors, Kelso.

SEATON.—Sept. 17.—For erection of two cottages. Mr. Stubbs, Church Road, Seaton, Cumberland.

SKIPTON.—Sept. 17.—For the walling at Farefield Road improvement. Mr. A. Rodwell, surveyor, Skipton.

SITTINGBOURNE.—Sept. 19.—For the erection of a temporary building at the County School for Girls. Mr. E. C. Pearcey, local secretary, 45 High Street, Sittingbourne, Kent.

SOUTHALL.—Oct. 4.—For the following, for the Southall Norwood Urban District Council, viz.:—(*a*) Boiler house; (*b*) hot-water heating; (*c*) hot-water supply at the sanatorium; and (*d*) paving works; and (*e*) channelling work. Mr. Reginald Brown, A.M.I.C.E., F.S.I., &c., engineer and surveyor, Public Offices, Southall, Middlesex.

SOUTHAMPTON.—Sept. 19.—For alterations and heating apparatus to cells at the Winchester county police station. Deposit 1*l.* 1*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

SWINESHEAD.—Sept. 17.—For erecting Swineshead Church boundary wall and iron fencing, 96 yards running wall and palisade and 76 yards running iron fencing. Mr. Maurice J. Johnson, Swineshead.

SEAFORD (SUSSEX).—Oct. 5.—For the supply and erection—subject to the sanction of the Local Government Board being obtained for the loans—of a two-cell destructor and boiler, in a building to be constructed by the Council at their sewage pumping station. Deposit 2*l.* 2*s.* The Offices of the Council, or Messrs. Pollard & Tingle, engineers, 31 Old Queen Street, Westminster, S.W.

WALES.—Sept. 17.—For erecting a brick wall at Cardiff Workhouse. Mr. Arthur J. Harris, clerk, Union Offices, Queen's Chambers, Cardiff.

WALES.—Sept. 19.—For extensions and alterations to the Pantygasseg Council school, near Pontypool; also for extensions and alterations to the Pengam Council school, Pengam, for the Monmouthshire Education Committee. Deposit 1*l.* 1*s.* Mr. John Bain, F.R.I.B.A., County Council Offices, Newport, Mon.

WALES.—Sept. 21.—For re-building two houses at Pontwalby, Glyn-Neath. Mr. J. Llewellin Smith, M.S.A., Aberdare.

WALES.—Sept. 22.—For erection of two temporary waiting-rooms for Labour Exchange purposes, at Bute Docks, Cardiff. The Postmaster, Head Post Office, Cardiff, or H.M. Office of Works, &c., Storey's Gate, S.W.

WALES.—Sept. 22.—For erection of 240 houses and 10 shops on the Glyn Gwyn Estate at Bedwas, Mon., for the Tre Thomas Building Club. Mr. James T. Jenkins, architect and surveyor, Porth, Glamorgan.

WALES.—Sept. 27.—For erection of thirty houses at Penygraig for the Hendrecafn Building Club. Mr. Moses Thomas, auctioneer, Penygraig; or Mr. Edward Rees, Taff Street, Pontypridd.

WALES.—Sept. 27.—For erection of drill-hall and quarters at Treharris, for the 5th Batt. the Welsh Regiment. Mr. William Dowdeswell, M.S.A., architect, Treharris.

WALES.—Oct. 1.—For building a school (accommodation 500) at Hendy, Pontardulais, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., County Architect, County Education Offices, Carmarthen.

WELLINGTON.—Sept. 24.—For erection of a secondary school to accommodate 200 pupils at Wellington, Salop. Messrs. Shayler, Swan & Ridge, joint architects, 16 Pride Hill, Shrewsbury. Send 3*l.* 3*s.* deposit to Mr. W. Windsor, quantity surveyor, 37 Brown Street, Manchester.

WORKSOP.—Sept. 23.—For erection of two shops, with stable, warehouses, and other out-buildings, and one cottage, on land in King Street, Hodthorpe, Whitwell, for the Worksop Co-operative Society, Ltd. Mr. E. Allsopp, architect and surveyor, Sherwood Road, Worksop.

WREXHAM.—Sept. 28.—For the following works, for the Guardians of Wrexham Union, viz.:—Contract (*a*), erection of a new boiler house, chimney stack, &c.; (*b*) constructing one Lancashire steel boiler, providing steam feed and waste pipes, calorifiers, pump, injector, Berryman heater, &c. Contract (*a*), deposit 3*l.* 3*s.* Mr. J. Price Evans, Argyle Chambers, Wrexham. Contract (*b*), deposit 3*l.* 3*s.* Mr. J. Oswell Bury, clerk, 9 Temple Row, Wrexham.

MESSRS. BELL & CAMERON, architects, Pitlochry, N.B., have prepared plans for the erection of a two-storey stone and lime building at the Central School, Pitlochry, for classes in gymnastics, cookery, and laundry work. The estimated cost, including fittings, is 2,444*l.*

THE new Barnstaple Grammar (Devon County Secondary) School was opened on the 8th inst. The school, which is a two-storey brick and stone building, occupies a healthy position at the higher end of Barnstaple, overlooking the Taw, standing in its own grounds of some thirteen acres. The scheme has involved a capital expenditure of 14,000*l.* Designed by Mr. Percy Morris, the architect to the Devon County Education Committee, the building costs on the contract 9,418*l.*, and the land has cost another 4,100*l.*

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TENDERS.

CHESHAM.

For private street works, for the Urban District Council. Mr. PERCY C. DORMER, engineer and surveyor, Chesham.

	Khartoum Avenue.	Addison Road
Trueman, Ltd.	£800 0 0	£225 0 0
Mead & Son	550 0 0	160 0 0
Freeman	523 0 0	149 0 0
Wright	461 12 7	137 10 0
Brummell	424 5 9	—
Free & Sons	420 0 0	129 0 0
GREEN & Co., Aylesbury (*accepted*)	415 10 0	123 10 0

CUDDINGTON.

For making-up (1) Moreton Road and (2) Windsor Road, Epsom. Mr. T. E. WARE, surveyor, Epsom.

Moreton Road.

Trueman, Ltd.	£595 0 0
May & Son	495 0 0
Thacker & Co.	485 0 0
KAVANAGH & Co., Surbiton Hill (*accepted*)	447 0 0

Windsor Road.

Trueman, Ltd.	190 0 0
May & Son	177 10 0
Thacker & Co.	140 0 0
KAVANAGH & Co., Surbiton Hill (*accepted*)	137 0 0

DRIFFIELD.

For erecting dwelling-house, for Mr. J. F. Robinson. Mr. JOSEPH SHEPHERDSON, architect, Bridlington.

Accepted tenders.

Leason, brickwork	£358 0 0
Julian, woodwork	168 7 6
Stabler, plumbing	78 15 0

EASTBOURNE.

For erection of a cottage at Roselands. Mr. W. CHAPMAN FIELD, borough architect and building engineer.

Plan "A."

Martin	£675 0 0
Relf	644 0 0
Bodle	625 0 0
Hookham	532 0 0
Allcock	500 0 0
Architect's estimate	500 0 0

Plan "B."

Bodle	550 0 0
Martin	545 0 0
Relf	524 0 0
Hookham	407 0 0
ALLCOCK, Eastbourne (*accepted*)	398 10 0

GATESHEAD.

For foundation works for new asylum at Stannington, and for twelve cottages for staff, for the visiting committee of the Gateshead Corporation. Messrs. G. H. HINE & CARTER PEGG, architects, Westminster.

J. & W. Lowery	£21,233 12 8
Blackett & Son	20,686 14 4
Bowen & Sons	20,666 7 11
Henderson & Son	18,899 9 8
Nicholson & Co.	18,850 0 10
Milne	18,488 17 2
Davidson & Miller	18,445 5 9
D. & J. Rankin	18,303 19 2
George Douglass	17,997 5 9
John Douglass	17,973 11 5
Weir	17,955 12 10
Hope	17,889 14 8
Burnett & Son	17,320 0 0
Moss & Sons	16,808 17 1
Pringle	16,706 8 1
Carse & Son	16,674 7 8
Haswell & Waugh	16,615 4 1
Lumsden	16,592 1 0
Ferguson	16,399 7 4
White	16,349 7 7
Weatherley	16,141 0 0
Green & Sons	15,994 13 6
Foster	15,749 9 7
EASTEN, Newcastle (*accepted*)	15,679 14 0
Dykes & Smith	12,347 0 0

For well and borehole at above:—Timmins & Son, Runcorn, at schedule of prices (*accepted*).

HALIFAX.

For erection of isolation wards and kitchen at the Borough Hospital, Stoney Royd. Mr. JAMES LORD, M.I.C.E., borough engineer, Halifax.

Accepted tenders.

Firth & Son, mason, excavator and bricklayer	£800 0 0
Greenwood, carpenter and joiner	285 3 0
Green, plumber and glazier	240 0 0
Bancroft & Son, concretor	163 0 0
Bancroft & Son, slater and plasterer	110 0 0
Berry, steelwork	78 17 4
Moody, painter	44 19 8

IRELAND.

For carrying out the following:—(1) Heating (male block, convalescent department); (2) increasing height of chimney at laundry; (3) lavatory, &c., accommodation (male infirm department); (4) ward kitchens (infirmary); (5 and 7) coal shed (laundry), raising roofs, and repairs kitchen (convalescent department); (6 and 8) putting in new skylights (convalescent department) and making cubicles (nurses' home), for the Board of Guardians. Messrs. YOUNG & MACKENZIE, architects and engineers, Belfast.

Accepted tenders.

Lowden & Co., Ann Street, Belfast (No. 1)	£274 18 9
Lowden & Co., Ann Street, Belfast (No. 3)	289 0 0
Dowling, 106 & 112 Cromwell Road, Belfast (Nos. 5 and 7)	145 0 0
Kidd, 55 Antrim Road, Belfast (No. 4)	83 0 0
Kidd, 55 Antrim Road, Belfast (Nos. 6 and 8)	70 0 0
Hunter Bros. & Co., 23 Claremont Street, Belfast (No. 2)	36 0 0

LONDON.

For road repairing and tar paving work at the Northern Hospital, Winchmore Hill, N., for the Metropolitan Asylums Board.

Griffiths & Co.	£1,166 10 0
Adams	1,157 0 0
Roadamant Co.	772 14 6
Woodham & Sons	497 0 0
Ground & Newton	358 15 0
Greenfield, Enfield (*recommended*)	334 13 0
Engineer-in-chief's revised estimate	440 0 0

For erection of a discharge block with staff quarters at the Eastern Fever Hospital, Homerton Grove, N.E., for the Metropolitan Asylums Board. Mr. W. T. HATCH, M.Inst.C.E., engineer-in-chief.

Beaves	£4,310 0 0
Reason	3,798 0 0
Barrett & Power	3,782 18 4
Garrett & Son	3,662 0 0
Perry & Co.	3,625 0 0
Blake	3,625 0 0
Kirk & Randall	3,561 0 0
E. Lawrence & Sons	3,431 0 0
Wall	3,418 0 0
Pasterfield & English	3,399 0 0
Turtle & Appleton	3,370 0 0
Oram & Son	3,360 17 6
F. & G. Foster	3,230 0 0
Webb & Co.	3,190 0 0
W. Lawrence & Son	3,118 0 0
Nightingale	3,106 0 0
Kazak, Belvedere (*recommended*)	2,912 0 0
Engineer-in-chief's revised estimate	2,775 0 0

For tarpaving works and repairs at Tooting Bec Asylum, S.W., for the Metropolitan Asylums Board.

Shepherd & Sons, Teddington (*recommended*)	£248 10 0

STURMINSTER NEWTON.

For constructing sewers, &c., at Butt's Pond and Gott's Corner. Mr. G. F. HAZELL, surveyor.

Wort & Way	£138 0 0
Clarke	130 0 0
Williams, Farley & Co.	125 19 6
Maidment	122 18 2
Inkpen	109 7 0
Loader	108 15 0
Tryhorn	103 13 6
HAYWARD & SON, Okeford Fitzpaine and Blandford (*accepted*)	101 3 0

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MERTON.

For making-up Burlington Road. Mr. G. JERRAM, surveyor.

Kavanagh & Co.	£3,597	0	0
Mowlem & Co.	3,482	0	0
E. & E. ILES, Wimbledon (*accepted*)	3,290	0	0

SCOTLAND.

For the work and material required in the extension of their tramways to Dysart, for the Kirkcaldy Corporation. Messrs. J. L. LUMSDEN, burgh surveyor, and O. F. FRANCIS, burgh electrical engineer.

Martin	£8,781	0	0
White	8,389	0	0
Brebner & Co.	8,000	15	0
Brunton & Sons	7,437	15	6
Stark & Sons	7,203	3	6
Scott, Marshall & Co.	7,164	8	3
Stark & Dobbie	7,086	19	0
Smith & Sons	7,017	15	0
Trentham	6,725	0	0
Griffiths & Co.	6,703	6	3
Dobson, Edinburgh (*recommended*)	6,664	3	2

WATFORD.

For erection of additional fire stairs at the children's homes.

Crittall Co.	£181	0	0
Hayward Bros.	129	15	0
ST. PANCRAS IRON CO. (*accepted*)	128	5	0

SCOTTISH BUILDING TRADES' FEDERATION.

THE sixteenth annual general meeting of the Scottish Building Trades' Federation was held in the Building Trades' Exchange, Lothian Road, Edinburgh, on the 9th inst. Mr. Hector MacVinish, Inverness, presided, and delegates attended from the principal centres in Scotland. The Executive report for the past year, which was submitted by the secretary, Mr. James Cameron, solicitor, Edinburgh, stated that another lean year in the building trade throughout Scotland had to be recorded, but there was hope of improvement in the near future, as several of the principal centres reported that trade was on the upward grade. Trade was reported to be dull, however, in Aberdeen, Paisley, Kilmarnock, Dundee, Airdrie, Coatbridge, Inverness, and Hawick. Edinburgh showed signs of improvement, while the brick-building trade in Glasgow was better than it had been for some time past. Plumbing, masonry, and joinery still continued dull. The financial report showed the finances to be on a sound basis. The apprenticeship question in the trade was considered. In some centres, it was reported, difficulty was experienced in getting apprentice masons particularly, but it was thought that with an improvement in trade the necessary supply of apprentices would be forthcoming. Mr. Cameron was appointed to attend the next National Conference of secretaries to be held at Manchester on October 19, while an arrangement was come to for a monthly interchange of matters of interest between the Building Trades' Federation and those of Germany, Belgium, Holland, and South Africa. The following office-bearers were elected for the ensuing year:—President, Mr. D. Wilson, J.P., Edinburgh; vice-president, Mr. James Farquharson, Aberdeen; secretary and treasurer, Mr. James Cameron, solicitor, Edinburgh.

TRADE NOTES.

MESSRS. NEWTON, CHAMBERS & CO., LTD., of Thorncliffe, near Sheffield, have been awarded a Grand Prix by the judges at the Japan-British Exhibition for their disinfectant fluid Izal. Although premier honours have been awarded to Izal on many former occasions, this latest recognition bears fresh witness to the reliability and excellence of this well-known disinfectant preparation. Izal is offered for many purposes—sanitary, surgical, horticultural, and veterinary—and much useful work in connection with the scientific use of disinfectants has been done in the laboratories at Thorncliffe.

THE "Shark" Grip Tiling Co. (1910), Ltd., advise us of their having purchased the entire goodwill and assets of the "Shark" Grip Opal Tiling Co., Ltd., and have opened new offices and showrooms at 69 Newman Street, W. They retain the service of the old staff under the general management of Mr. A. Attride, and are completing the contracts undertaken by the old company.

THE eleventh ordinary general meeting of the Associated Portland Cement Manufacturers (1900), Ltd., will be held at Winchester House, Old Broad Street, in the City of London, on Thursday, September 22. The directors report that notwithstanding the unfavourable condition of the cement trade practically all through the period, the net profits of the company for the past year are but little below those of the preceding year. During the year the demand for Portland cement was considerably below the capacity for production of the countries in which it is manufactured, and the price fell to an unprecedentedly low level. Late in the spring an improvement in the demand resulted in a material hardening of prices, which, however, came too late in the Company's financial year to prevent the average price from being greatly below the former year's level, and but for some further savings in manufacturing cost, largely due to capital expenditure, the profits would not have escaped a serious reduction. The directors recommend that, as in previous years, a sum of 25,000*l.* be carried to the general reserve and depreciation account, bringing that account to 220,000*l.* The total charge for the year for sinking funds, depreciation and reserve (including the amount written off patents and the reserve for bad and doubtful debts) will then amount to 60,848*l.* 16*s.* 8*d.* It is proposed to carry to the general reserve and depreciation account, 25,000*l.*; the directors recommend a final dividend on the preference shares to June 30, 1910, at the rate of 5½ per cent. per annum, amounting to 59,442*l.* 7*s.*, leaving to be carried forward 41,343*l.* 14*s.* 10*d.*

VARIETIES.

THE Grimsby Town Council have rejected a proposal to spend 20,000*l.* on the construction of a direct road from the town to the new deep-water dock at Immingham.

THE Birkenhead Board of Guardians have decided to erect infirmary buildings at Tranmere Workhouse at a total estimated cost of over 33,000*l.*

THE Louth Town Council have received the assent of the Local Government Board to the loans of 19,940*l.* for the sewage disposal scheme, and 600*l.* for land for the works.

MESSRS. TAYLOR, WALLIN & TAYLOR, engineers, Newcastle-on-Tyne, have prepared plans for a sewerage scheme on the bacterial system for Kirkby Stephen. The cost is estimated at 3,900*l.*

THE Belfast Corporation are considering the comparative merits of gas and electricity for street lighting. At present only two or three of the principal thoroughfares are adequately illuminated.

THE Burnley Town Council on Wednesday last agreed to accept the tender of Messrs. Macdonald & Deakin, of Westminster, amounting to 158,828*l.*, for the construction of the new reservoir at Hurstwood Valley. Messrs. James Diggle & Son, of Victoria Street, S.W., and Heywood, are the engineers.

SUBJECT to the Local Government Board's sanction to a loan of 22,000*l.*, the erection of a concert pavilion on the fort undercliff, Margate, will be proceeded with, plans having been approved by the Corporation.

THE Barnsley Town Council terminated on Tuesday a discussion which has lasted a considerable time, by deciding to construct a refuse destructor with a capacity for burning 7,500 tons of refuse, at an estimated cost of 5,360*l.*

THERE is a hopeful outlook in Bexhill that the building trade will be busy during the ensuing winter, many plans for new houses and private schools having been submitted to the local authority.

THE Newport Corporation Works Committee recommend that the borough engineer and surveyor who will be appointed instead of the late Mr. R. H. Haynes be paid a salary of 700*l.* per annum.

AT a special meeting of the Consett Urban District Council plans for new sewage works were finally approved, and it was resolved to make application to the Local Government Board for sanction for a loan of 16,000*l.*

MESSRS. MANGNALL & LITTLEWOOD, of Manchester, the designers of the Pavilion Theatre on Weymouth Pier, have been commissioned to erect a building adjoining it as a winter pavilion.

THE Troon Town Council have approved a recommendation that a refuse destructor should be provided on the north shore. It is considered that the most suitable installation would be of the two-cell back-feed type.

THE Blyth Council are considering a scheme for the purchase of a site abutting on Bridge Street and Union Street, on which to erect a town hall, shops, municipal offices, &c., at a cost not exceeding 15,000*l.*, inclusive of the site.

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ROYAL ACADEMY EXHIBITION, 1910.—Mr. BASIL SUTTON, A.R.I.B.A. (Messrs. WEBB & SUTTON), Architect.

PLANS were passed last week for a new post office at Driffield. The new site is in Middle Street North, and three large dwelling houses will be extensively altered and made suitable for the purpose. The architects are Messrs. Thorp & Turner, of Goole.

DURING the work of restoration at Morton House, Hatfield, which is now being carried out under the supervision of Mr. Winter Rose, architect, for Mr. F. W. Speaight, there has just come to light an ancient oak roof that for several centuries has been covered with laths and plaster; several coins of James I. period have also been found.

IN order to remedy the acoustic difficulties in Salisbury Cathedral, a sounding-board has been placed in position. The board, which is suspended over the pulpit from a bracket on the large pillar close by, was designed by Mr. C. E. Ponting, F.S.A., the diocesan architect. It is executed in brown Austrian wainscot oak, and the plan is octagonal, to match the pulpit.

WITH the object of encouraging the contribution of useful papers on the materials employed in, and the applications of, concrete, in either the general or the special aspects of the subject, the Council of the Concrete Institute have decided to award a medal annually for the paper which they consider to be of the greatest merit in each session. Communications should be addressed to the Secretary of the Concrete Institute, 8 Waterloo Place, Pall Mall, S.W.

THE Llantrisant and Llantwit Fardre Rural District Council have received the sanction of the Local Government Board for the Council to borrow 21,000*l.* for the Ely Valley sewerage scheme. The Council will borrow the money at 3½ per cent. for repayment within a period of thirty years. The engineer for the scheme is Mr. Gomer S. Morgan.

THE Durham County Council have given official notice of their intention to erect new elementary schools at Seaton Snook (100 children), Morley (150 children), Lumley Sixth Pit (900 children), Lumley (250 children), and Byers Green (350 children). They also propose to enlarge Sherburn School by about 100 additional places.

THE Inverkeithing School Board on Monday agreed to ask for competitive plans for a school to accommodate between 900 and 1,000 pupils, at a probable cost of 10,000*l.* Meantime a temporary school is being provided, and a school is also to be erected at Limekilns, near Rosyth, costing between 2,000*l.* and 3,000*l.*

THE *Deutscher Reichsanzeiger* (Berlin) of September 2 reports that a project is on foot for the erection in Havana of a palace intended for the President of the Republic of Cuba. A committee composed of seven members is to be formed for the purpose of drawing up particulars of the scheme. It is understood that an international competition will be held for the presentation of plans, and that a first and second prize not exceeding 10,000 pesos and 5,000 pesos

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respectively will be awarded. The direction of the work may, if it is deemed desirable, be entrusted to the author of the plans ultimately accepted. The cost of the work must not exceed 1,000,000 pesos.

OWING to the increasing population and the necessity of coping with the floods during heavy rains, the joint Sewage Board of Scunthorpe and Crosby recently applied to the Local Government Board for 5,300*l.* to carry out part of the original scheme, which is estimated to cost 22,500*l.* A public inquiry was held at Scunthorpe last week by Major Stewart, R.E. Messrs. J. Lysaght, Ltd., who are building steel-works in the district, urged that the main sewer should be continued a mile to serve the village they are building at the works. This village will comprise 104 acres; 300 houses are to be erected shortly, and 2,000 people will be dependent on the works.

NEW ZEALAND has for some years past been engaged in carrying out an extensive scheme of afforestation to provide against the depletion caused by the growth of the saw-milling industry. For a portion of this work State prisoners are employed, camps controlled by gaol officials being formed near the sites of the various nurseries and plantations. The planting is supervised by experts, and in Rotorua alone more than 24,000,000 trees have been permanently planted out by prison labour. Not only have the results been satisfactory from the point of view of afforestation, but also the conditions of the camp life are said to exercise a most beneficial influence on the characters of the prisoners.

A NEW grand stand is to be erected at Powderhall Recreation Grounds, Edinburgh, the plans for which were passed on the 8th inst. by the Edinburgh Dean of Guild Court. The new stand, which will be erected on the site of the present structure, will be over 200 feet in length, and has accommodation for over 2,000 persons. On concrete foundations, the new building and its roof covering will be constructed chiefly of steel, while the back and sides will be of timber framing and glazed screens. Immediately under the stand there will be refreshment rooms, cloakrooms and lavatories. The entrance will be at the centre, and the exits at either end. The work, which is being carried out under the direction of Mr. R. M. Cameron, architect, is expected to be completed before December.

THE sixty-ninth session of Glasgow School of Art commenced on the 8th inst. The number of enrolments is larger than in previous years, and includes pupils from various parts of Scotland sent to complete their diploma course at the school. These pupils will attend the school under a scheme of affiliation with various local schools recognising the Art School as the university in which higher studies alone are made. The subject of figure composition is to receive much greater attention in the future than has hitherto been devoted to this branch, and it is to be associated with design and architecture. Decorative art studies are also being developed. By co-ordination between the school and the Technical College the school will be relieved of the need to supply technical knowledge.

THE Chertsey Rural District Council last week approved plans submitted by Mr. Locke-King for the erection, at the Byfleet end of the ground, at Brooklands, Surrey, of workshops for the manufacture and repair of aeroplanes; and designs for a dirigible airship garage are now being prepared. The premises, which are to adjoin the present sheds, will consist of a workshop 50 feet by 30 feet, a repairing shed 70 feet by 45 feet, an electric power station, and offices for drawing and clerical work. The workshop will be completely equipped with machinery and appliances for the construction of any type of flying machine, and the execution of every kind of repair. The electric generating station will supply current for running machinery and lighting the whole of the forty aeroplane sheds now completed or in course of erection.

AN appeal is being made this week by the Dean and Chapter of Wells for assistance in the repairs of the central tower of the ancient cathedral church. Between 1893 and 1910 the expenditure of the Dean and Chapter upon the necessary repairs of the fabric exterior has exceeded 5,000*l.* A fresh and exceptional burden has been laid upon them which will press heavily and increasingly for years, unless some immediate relief can be given which will enable them to put the decayed portions of the masonry of the tower in complete repair. They have no balance in hand, but a continuous and increasing deficit. They feel it to be their duty to raise not less than 3,000*l.* without delay for repairs of the tower especially, and for extinction of debt upon the fabric.

THE building trade in Crewe is reported to be booming at last. Among the important contracts on hand mention may be made of the big Railway Orphanage off Victoria Avenue, for the trustees of the late Mr. F. W. Webb; the Cheshire Training College, the Bedford Street Schools, the Ursuline Convent off Nantwich Road, the new Lyceum Theatre in Heath Street, and the Counties Bank in Market Street. New schools in Hightown and Derby Street have also to be put up, and new sewerage extensions are to be carried out. These undertakings represent an expenditure of nearly 100,000*l.*

TRADE MARKS OF CONSTRUCTIVE MANUFACTURERS.

WE have received from Jacques Gevers & Co., L'Agence de Brevets et Marques de Fabrique, 70 Rue Saint-Jean, Antwerp, the following list of trade-marks published in March, April and May, 1910:—

ENGLAND.

Constructive Materials.

"GALVANIT"	Herr Otter & Co., Husemerstrasse 12, Hamburg.
"GEM"	The General Supplies Co., Ltd., 22 Peartree Street, Goswell Road, London.
"BITUMITE"	George M. Callender & Co., Ltd., 25 Victoria Street, Westminster, S.W.
"ROY OAK"	Ragosine & Co., Ltd., Albion Wharf, Bow, London, E.
"HEYWOOD"	The Haslemere Builders, Ltd., Station Road, Haslemere, Surrey.
"DUTLYN"	Dutton, Massey & Co., Tower Buildings, Water Street, Liverpool.

Colours, Preservatives, &c.

"TIMBROL"	C. A. Birch & Co., Trundle Street Paint Works, Hull.
"THE MORE YOU WASH IT THE BETTER IT LOOKS"	The Copal Varnish Co., Ltd., 119 Palmerston House, London, E.C.
"CHARBOW"	Charles Bowman, Ltd., 6 King Street, Tower Hill, London, E.
"DUTAMEL"	James Morris, jun., 40 Ashburton Road, Birkenhead, Cheshire.
"NUNAMEL"	Percy Le Blanc Newberry, 27-28 Charterhouse Square, London, E.C.
"PLUVIT"	Ambrose Fry, 13 Arundel Avenue, Liverpool.
"PRELTO"	Douglas Herman, Hamer Street 75, St. Helens, Lancashire.
"VITRENE"	Charles Turner & Son, Ltd., 7, 8, 9 Broad Street, Bloomsbury, London, W.C.

GERMANY.

Cement.

"GLASIN"	Anton Weithaler, Karlsruhe i. B.
"PFERD"	Hannover'sche Portland-Cementfabrik, Act.-Ges., Hanover.
"PFERD"	Hannover'sche Portland-Cementfabrik, Act.-Ges., Hanover.
"SALDON"	Heinrich Lönholdt & Co., Frankfurt a. M.

Constructive Materials.

"TEXTOLAN"	Tapetenfabrik Coswig, Gesellschaft mit beschränkter Haftung, Coswig i. Sa.
"ANTIDUSTIN"	C. F. Weber, Act.-Ges., Plagwitz, Leipzig.
"ADLER-MARKE"	Deutsche Gips-Compagnie, Akt.-Ges., Hakenstein b. Osterode a. Harz.
"PATERBUSCH-LIGNIT"	Maximilian Freiherr von der Kettenburg, Schloss Kettenburg b. Bisselhövede.
"TARVIA"	Bristowe & Co., Ltd., London.
"GRAPHOID"	Wilhelm Schuler, Isny, Württemberg.
"Z. W. B."	Zechstein und Zechitwerke Bredelar, G.m.b.H., Bredelar.
"PARILYT"	Wilhelm Birck, Bremen.
"ORIGINAL-HURTGEN"	Hürtgen, Mönnig & Co., G.m.b.H., Lindenthal, Cologne.
"FLINTCOTE"	Gustav A. Meyer-Henniger, Hamburg.

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BELGIUM.

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"AXE BRAND" (hache, dessin) "CRYSTAL ROCK" "CHEXIREH BRAND" (sphinx, dessin, et pyramide) "KNIGHT BRAND" (guerrier) "ROCK BRAND" "EAGLE NEST BRAND" (aigle, dessin) "CRYSTAL BRAND" (pierre jetant des rayons) "HAND AND RING BRAND" "WHITE CROSS BRAND" (croix, dessin) "DOG BRAND" (tête de chien)	Société Anonyme des Carrières, Thorn, Chercq.
"CHANTECLER" (coq)	Charles Frère, Brussels.
"SAMSON BRAND" (homme luttant avec lion)	Société Anonyme des Carrières, Thorn, Antoing.
"EAGLE BRAND" (aigle)	Soc. F. & P. Bataille & Cie, Gaurain, Ramecroix.
"BRUSSELS S. MICHEL" (dessin)	Emile Hereux, Brussels.
"UNION" . .	Union Fraternelle, Calonne.
"THYSSEN" . .	Société Gewerkschaft Jacobs, Germany.
"MURALLAS CHINAS" (Portland Cement, first quality)	Adolphe Gross, Antwerp.

Roofing Materials, &c.

"PACHYTECT" . .	Friedrich Beer, Cologne.
"PALTAC" . .	Friedrich Beer, Cologne.
"ELEMENTETROTZ" (éclairs, C. S. T.).	Karl Streckfuss, Freiburg i. B.
"LAITIER" . .	Jules Delreux, Dottignies.
"VITRUM" (lune) .	Charles J. Pareyn, Brussels.
"CASTOR" (dessin Fober)	Jean Fober, Ganshoren.

HOLLAND.

Constructive Materials.

"S. P." . . .	Forsbacka Jernverks Aktiebolag, Forsbacka, Sweden.
"ZINAL" . . .	J. de Jong R. M. Zn., Akkrum en aldaar alleen handelende onder de firma G. S. Ruiter.
"PICCOLO" . .	W. & J. Vogel, Vohwinkel by Elberfeld.
"HERRING BONE" .	The General Fireproofing Co., Youngstown, Ohio., U.S. of America.
"SAXONIA" . .	R. Wolle, Leipzig.

Cement.

"LION" . . .	Aalborg Portland-Cement-Fabrik, Aalborg.
"BAVARIA" . .	Portland-Cement-Fabrik, Karlstadt am Main, vormals Ludwig Roth, Act.-Ges., Würzburg.
"ARBRE" . .	Offenbacher Portland-Cement-Fabrik, Act.-Ges., Offenbach am Main, Hesse.
"NECKAR" . .	Portland Cementwerk Diedesheim-Neckarelz, A.-G., Diedesheim-Neckarelz.
"SOLEIL" . .	Portland Cementwerke Heidelberg & Mannheim, A.-G., Heidelberg.
"COURONNE" . .	The Antwerp Portland Cement Works, Antwerp.

Colours, &c.

"PARILYT" . .	E. Virck, Malchow, Germany.
"VROOLYK, EERLYK, BEIDE TE ZAMEN, VREEMDE, FIRMA"	Badische Aniline- u. Soda-Fabrik, Actiengesellschaft, Ludwigshafen a. Rh.
"T. S R." . .	J. Thomas, handelende onder de firma Thomas & Struyck, Rotterdam.

FRANCE.

Cement.

"THYSSEN" . .	Société Gewerkschaft Jacobus, Hamborn, Germany.
"DEFENSA" . .	Société Peuvrel Hermanos, 121 Rue San-Martin, Buenos Ayres.
"ELEPHANT" . .	I. C. Johnson & Co., Ltd., 4 Eastcheap, London.

Constructive Materials.

"TERRASIT" . .	Firme Terrasit-Industrie, G.m.b.H., 117 Ringbahnstrasse, Berlin-Halense, Germany.
"PIERRE DES CARRIERES DE STE-JUSTE"	Société Générale des Carrières du Midi, 4 Rue de la Bourse, Lyons.
"VERNIS NATUREL"	M. Bridoux (Arthur), 7 Rue Mouraud, Paris.
"GRAPHITALIN" .	M. Combe (Eugène-Emile), 21 Rue du Louvre, Paris.
"PRINCE NOIR" .	M. Grand (Fernand), 47 Faubourg Saint-Georges, Nancy.
"COMETE" . .	M. Descotils (Georges), 136-138 Rue de Rennes, Paris.
"MONOLITHE" . .	M. G. S. Albanèse, 62 Rue Saint-Lazare, Paris.
"STUC CHAUVET" .	M. Chauvet (Léonce), 17 Rue Boileau, Paris.
"KUB" . . .	Société des Boissons Hygiéniques, 8 Place de l'Opéra, Paris.
"MARTIN FRERES" .	Société Générale des Tuileries de Marseille, Saint-Henri, Marseille.
"RICHEMONT" .	Société Anonyme des Carrières des Charentes et du Poitou, Angoulême.

Colours.

"LUCIFER" . .	Société Lefranc et Cie, 16 Rue de Valois, Paris.
"CAMT" . . .	MM. veuve Toussaint et fils, 16 Rue Roussel, Paris.
"CÉRUSE D'AUVERGNE"	M. Frip (Louis), Rue Fongière, Clermont-Ferrand.
"TÉTÉBENTHOLE" .	M. Fric (Louis) Clermont-Ferrand.
"LEVANT" . .	M. Fric (Louis) Clermont-Ferrand.
"MINIOLEINE" .	M. Combe (Eugène-Emile), 21 Rue du Louvre, Paris.
"SALAMANDRE" .	Société Anonyme dite Fabrique de Vernis et Produits Chimiques, Vernier, près Genève, Switzerland.
"AQUALIN" . .	M. Combe (Eugène-Emile), 21 Rue du Louvre, Paris.
"GÉMALINE" . .	M. Combe (Eugène-Emile), 21 Rue du Louvre, Paris.
"BRASERO" . .	M. Rosset (Victor), 1 Boulevard du Temple, Paris.
"CÉRUSIN" . .	M. Givret (Ernest), Rue Dutot 18, Paris.
"SOUVERAIN" . .	M. Blankenberg (Bernard), 31 Rue des Francs-Bourgeois, Paris.
"RED SUN VARNISHES"	Société Bordier et Archambault, Tours.
"CAMT" . . .	M. Vve Toussaint et fils, Paris.
"FUSÉE" . .	M. Dausse (Georges), Nice.
"GILSONITE" . .	The Barber Asphalt Co., Philadelphia, U.S.A.
"ISOLEOL" . .	M. Rolin (Gaston), 8 Place de la Madeleine, Paris.

SWITZERLAND.

Constructive Materials.

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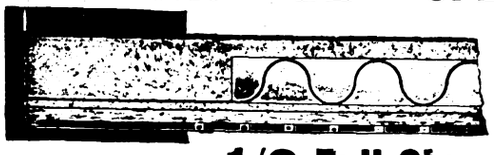
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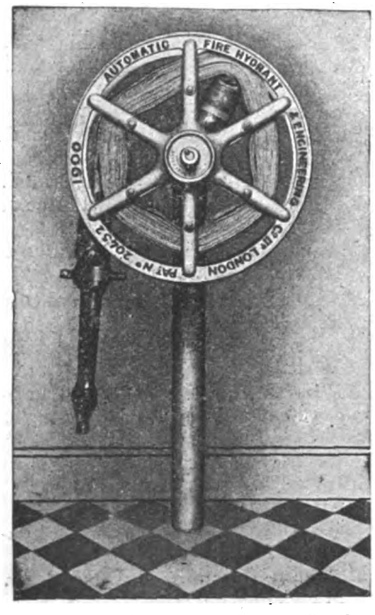
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THE

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

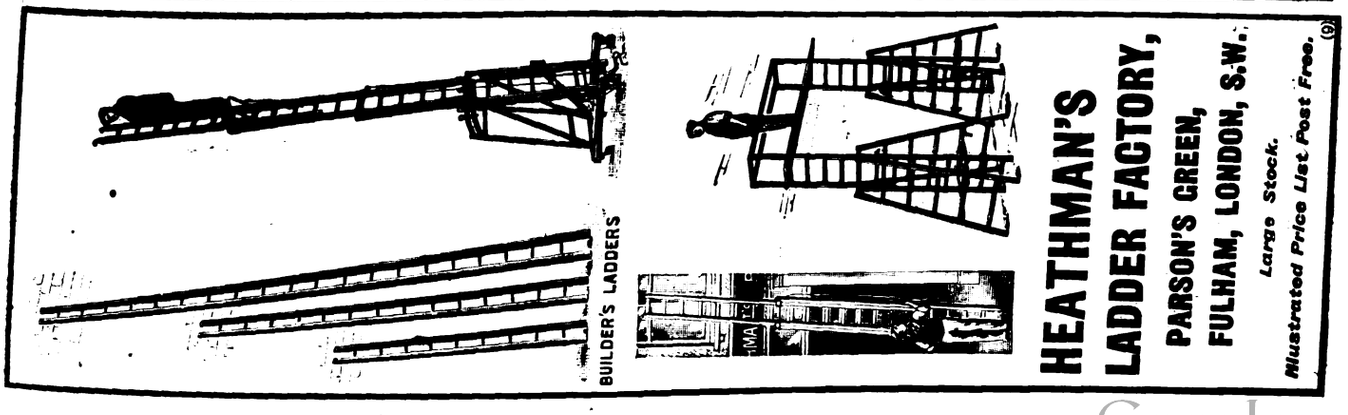
Antwerp.—Oct. 1.—An international competition is being arranged for a scheme for the laying out of the land surrounding Antwerp, which will shortly be available by the demolition of the encircling fortifications. Premiums of 1,000*l.*, 400*l.*, and 200*l.* are offered. Copies of the conditions, &c., may be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C., or, on payment of 100 francs from the "Commission d'études de l'aménagement de l'agglomération anversoise," 57 Rue du Jardin des Arbalétriers, Antwerp.

Bournemouth.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

Brighton.—Oct. 1.—The Governors of the Brighton, Hove and Sussex Grammar School invite architects experienced in scholastic buildings to submit their names for a proposed limited competition. The Governors intend to erect new buildings at a cost of about 16,000*l.* Send names and particulars of buildings by Oct. 1 to Mr. A. F. Graves, clerk to the Governors, 9 North Street Quadrant, Brighton. (For further details see advertisement Sept. 16.)

Ireland.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

Ireland.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook,



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Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

MANCHESTER.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary. Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

RUISLIP.—Nov. 15.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

WALES.—Oct. 1.—The Town Council of the borough of Denbigh invite competitive plans and designs of a public hall, markets, municipal buildings, &c., which it is proposed to erect at a cost not to exceed 10,000*l.* Three premiums are offered, viz. 75*l.*, 30*l.* and 20*l.*, as first, second and third respectively. Send 1*l.* 1*s.* deposit for particulars, &c., Mr. J. Parry Jones, town clerk, Denbigh.

CONTRACTS OPEN.

BENSHAM.—Oct. 4.—For a small alteration at the Workhouse for the Gateshead Union. Messrs. Newcombe & Newcombe, architects, Pilgrim Street, Newcastle-on-Tyne.

BIRMINGHAM.—Sept. 28.—For the erection of workshops, offices, &c., for the purposes of a lighting depôt, in Cambridge Street. Deposit 2*l.* Mr. Henry E. Stilgoe, M.I.C.E., city engineer and surveyor, Council House, Birmingham.

BISHOP'S STORTFORD.—Oct. 3.—For alterations and additions to the laundry at the workhouse. Mr. Alfred G. Gwynn, clerk, 29 North Street, Bishop's Stortford.

BLACKBURN.—Oct. 3.—For the erection of a new police station, sessions court, &c., on Blakey Moor (superstructure section). Send 1*l.* 1*s.* at once. Messrs. Briggs, Wolstenholme & Thornley, and Stones & Stones & Atkinson, Richmond Terrace, Blackburn.

BRIDGNORTH.—For erection of one detached residence and two semi-detached residences at Bridgnorth. Mr. B. Bradley, architect, Norwich Union Chambers, Birmingham.

CANTERBURY.—Sept. 26.—For additions at "Woodville," Wincheap Street, for the Guardians. Mr. H. Doré, architect, 82 Castle Street, Canterbury, Kent.

DARTMOUTH.—Oct. 1.—For providing and fixing a quantity of wrought-iron railing at the Longcross Reservoir. Mr. Thos. W. Joyce, A.M.I.M.E., F.G.S., borough engineer and surveyor.

DOUGLAS.—Oct. 1.—For new mission hall and Sunday school at St. Matthew's, Douglas, Isle of Man. The Rev. H. S. Taggart, M.A., St. Matthew's Vicarage, 2 Mount Havelock.

EAST RIDING.—Sept. 28.—The education committee invite tenders for the following:—(*a*) The erection of a school for 122 children and teachers' house at Luttons Ambo; (*b*) the erection of a school for 162 children at Sutton-on-Hull; and (*c*) boundary walls at Norton (Malton). Deposit 1*l.* 1*s.* in each case. The Building Surveyor, County Hall, Beverley.

ECCLESTON.—Sept. 24.—For erection of an elementary school at Eccleston, near St. Helens, to accommodate 170 scholars. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

EASINGWOLD.—Oct. 1.—For the erection of the proposed Secondary school for the North Riding of Yorkshire County Council education committee. Send names by Oct. 1 to Mr. J. C. Wrigley, secretary, Education Offices, County Hall, Northallerton.

FARNWORTH.—Sept. 28.—For labour and materials required in laying wood block floors, also for construction, erection and supply of furniture for the Carnegie Library, Farnworth, Lancs. Deposit 2*l.* Mr. Walter J. Lomax, architect, 11 Fold Street, Bolton.

HARROGATE.—Sept. 27.—For a covered shelter in the Crescent Gardens. Mr. F. Bagshaw, borough surveyor, Municipal Offices, Harrogate.

HASLINGDEN.—Sept. 27.—For carrying out the following works, for the Guardians of Haslingden Union, viz.:—Supply and fixing of (1) iron balconies; (2) fire escape staircases; (3) wall tiling for bathrooms and corridors at the new infirmary, Higher Pike Law, Rawtenstall. Mr. Henry Ross, A.R.I.B.A., architect, 15 Cannon Street, Accrington. Apply to Mr. J. H. Sinkinson, clerk, Union Offices, Rawtenstall.

IRELAND.—Sept. 26.—For erection of a house at Cultra, Belfast. Messrs. Watt, Tulloch & Fitzsimons, architects, 77A Victoria Street, Belfast.

IRELAND.—Sept. 26.—For alterations to the Locomotive Engineer's Office, Dundalk, and raising the roof of the engine paint shop, Dundalk, and works in connection therewith, for the Great Northern Railway Co. (Ireland). Mr. T. Morrison, secretary, at Dublin or Belfast.

LEALHOLM.—For erection of three cottages, and also for the alterations and additions to other property at Lealholm, Yorks. Mr. Arthur E. Young, architect and surveyor, 77 Baxtergate, Whitby.

LEEDS.—Sept. 29.—For erection of a six-stalled brick urinal, to be built at the junction of Hunslet Road and Hunslet Lane. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

LONDON.—Sept. 27.—For painting, cleansing, and repair of various public buildings, &c., for the West Ham Town Council. Deposit 1*l.* Mr. John G. Morley, borough engineer, Town Hall, West Ham, E.

LONDON.—Oct. 5.—For supply and erection of an aviary and wrought-iron enclosure at Clissold Park, Stoke Newington, N., for the London County Council. The Parks Department, 11 Regent Street, S.W.

MAIDSTONE.—Oct. 12.—For erection of a cart shed and scratching shed on the Asylum farm, also glass roof over iron staircase adjoining buildings. The Engineer, Kent County Asylum, Maidstone.

MARDEN.—Sept. 27.—For erection of a cottage at Marden, Kent. Mr. Albert Barker, land agent, King Street, Maidstone.

MARGATE.—Sept. 28.—For demolishing the buildings known as Le Château Bellevue, adjoining Eastcliff House, Cliftonville, for the Metropolitan Asylums Board. Deposit 1*l.* Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, Office of the Board, Embankment, E.C.

MARGATE.—Oct. 17.—For erection of a dust destructor. Mr. E. A. Borg, borough surveyor, 13 Grosvenor Place, Margate.

MIDDLESBROUGH.—Sept. 27.—For the whole of the works required in erection of new junior mixed and infants' schools and the alterations and additions to the existing schools in Roman Road, Linthorpe, Middlesbrough. Send names and 2*l.* 2*s.* deposit to Mr. James Forbes, architect, 43 Albert Road, Middlesbrough.

MORLEY.—Sept. 29.—For the bricklayer, joiner, plumber, patent glazier, plasterer, concreter and slater works required in the erection of a weaving shed at Field Mills. Mr. T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, Yorks.

PLYMOUTH.—Sept. 29.—For erection and completion of County Court offices at the rear of the Guildhall. Deposit 2*l.* Mr. James Paton, borough engineer and surveyor, Municipal Offices, Plymouth.

POOLE.—Sept. 26.—For the following work, for the Town Council:—Item (1), painting to the exterior of the

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Town Hall; (2) repairs to the interior of the old police station, Market Square; (3) erecting shed for fire escape at Branksome depot; (4) painting to exterior of Lodge, Parkstone Cemetery; (5) painting to exterior of Heatherlands school, Branksome Heath school, and Oakdale school; (6) provision of one single and one pair of wrought iron gates at Alderney Isolation Hospital. Mr. Samuel J. Newman, F.R.I.B.A., borough surveyor, Municipal Offices, Market Street, Poole.

REDRUTH.—Sept. 26.—For the erection of a bungalow residence at North Country. Mr. Morley B. Collins, architect, Clinton Road, Redruth, Cornwall.

ROTHERHAM.—Oct. 4.—For erection of a balcony, &c., at the swimming baths, Market Street. Mr. Ernest B. Martin, A.M.I.C.E., borough engineer, Town Hall, Rotherham.

SCOTLAND.—Oct. 8.—For the mason, joiner, slater, plumber, plaster, glazier, and painter works required in the erection of a police station at Bridge of Earn. Messrs. Smart & Stewart, architects, 42 Tay Street, Perth.

SEAFORD (SUSSEX).—Oct. 5.—For the supply and erection—subject to the sanction of the Local Government Board being obtained for the loans—of a two-cell destructor and boiler, in a building to be constructed by the Council at their sewage pumping station. Deposit 2*l.* 2*s.* The Offices of the Council, or Messrs. Pollard & Tingle, engineers, 31 Old Queen Street, Westminster, S.W.

SHEFFIELD.—Sept. 29.—For erection of new galleries and structural alterations at Brightside and Park Baths. The City Architect, Town Hall, Sheffield.

SITTINGBOURNE.—Sept. 26.—For providing and laying a hard-wood floor at the Gymnasium, for the Sittingbourne Urban District Council. Mr. W. Leonard Grant, surveyor, Sittingbourne.

SOUTHALL.—Oct. 4.—For the following, for the Southall Norwood Urban District Council, viz.:—(*a*) Boiler house; (*b*) hot-water heating; (*c*) hot-water supply at the sanatorium; and (*d*) paving works; and (*e*) channelling work. Mr. Reginald Brown, A.M.I.C.E., F.S.I., &c., engineer and surveyor, Public Offices, Southall, Middlesex.

SOUTHAMPTON.—Oct. 6.—For the enlargement of the pavilion, Royal Pier, for the Southampton Harbour Board. Deposit 1*l.* 1*s.* Mr. E. Cooper Poole, A.M.I.C.E., engineer and surveyor to the Board, Harbour Offices, Town Quay, Southampton.

STANWAY.—Oct. 6.—For erection of a new school at Stanway, Essex, for 260 children, for the Lexden and Winstree district sub-committee. Send names and 3*l.* 3*s.* deposit by Oct. 6 to Mr. J. W. Start, F.S.I., architect, High Street, Colchester.

SWARBY (LINCS.).—Oct. 3.—For erection of a Primitive Methodist chapel, at Swarby. Mr. G. W. Cooper, architect and surveyor, Sleaford.

SYDENHAM.—Oct. 4.—For building a boundary wall at the Home Park Depot, Lower Sydenham, for the Lewisham Borough Council. Surveyor's Department, Town Hall, Catford.

THORNE MOORENDS.—Sept. 30.—The West Riding Education committee invite whole or separate tenders for the following works, in connection with alterations and additions to Thorne Moorends Council school, viz.:—Builder, joiner, slater, plumber, plasterer, painter. The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

WELLINGTON.—Sept. 24.—For erection of a secondary school to accommodate 200 pupils at Wellington, Salop. Messrs. Shayler, Swan & Ridge, joint architects, 16 Pride Hill, Shrewsbury. Send 3*l.* 3*s.* deposit to Mr. W. Windsor, quantity surveyor, 37 Brown Street, Manchester.

WEST VALE.—Sept. 24.—For joiner, plumber, plasterer, and slater works required in four through houses at Woodside, West Vale, Halifax. Mr. F. F. Beaumont, architect, Southgate Chambers, Halifax.

WALES.—Sept. 24.—For erection of a dwelling-house, coach-house and stable at Cefn Coed. Mr. R. Cound Jenkins, C.E., architect and surveyor, Cefn Coed.

WALES.—Sept. 26.—For proposed new bakery, Nantymoel, for the Nantymoel Industrial Co-operative Society, Ltd. Send names and qualifications on or before Sept. 26, to the Chairman, Co-operative, Nantymoel.

WALES.—Sept. 26.—For the provision and erection of iron classrooms at Ynyswen (Glam.), for the Rhondda Urban District Council. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WALES.—Sept. 27.—For erection of thirty houses at Penygraig for the Hendrecafn Building Club. Mr. Moses Thomas, auctioneer, Penygraig; or Mr. Edward Rees, Taff Street, Pontypridd.

WALES.—Sept. 27.—For erection of drill-hall and quarters at Treharris, for the 5th Batt. the Welsh Regiment. Mr. William Dowdeswell, M.S.A., architect, Treharris.

WALES.—Sept. 28.—For the rebuilding of the Fox and Hounds Inn, and three shops at Troedyrhiw. Mr. C. M. Davies, M.S.A., 112 High Street, Merthyr.

WALES.—Sept. 29.—For erection of Wesleyan Church at Ely, near Cardiff. Deposit 2*l.* 2*s.* Mr. H. P. Sanders, architect, 10 Windsor Place, Cardiff.

WALES.—Oct. 1.—For erection of a hall at Church Village, near Pontypridd, for the Efail Isha Congregational Church. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and engineers, Pontypridd.

WALES.—Oct. 1.—For erection of fifteen houses at Pontyclun, for the Pontyclun Building Club. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and engineers, Pontypridd.

WALES.—Oct. 1.—For building a school (accommodation 500) at Hendy, Pontardulais, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., County Architect, County Education Offices, Carmarthen.

WALES.—Oct. 4.—For erection of branch premises at Talywain, Mon., for Messrs. the Abersychan, British and Talywain Industrial Co-operative Society, Ltd. Mr. A. Gordon Babbidge, architect and surveyor, Clarence Chambers, Pontypool.

WIGTON (CUMBERLAND).—Sept. 26.—For the laying down of maple floor at the swimming bath, Mr. Joseph W. Crookes, clerk.

WORSBROUGH DALE.—Sept. 24.—For additions to the conveniences of the infants' school. Mr. Arthur Whitaker, architect, Kingwell Close, Worsbrough Dale, Yorks.

WREXHAM.—Sept. 28.—For the following works, for the Guardians of Wrexham Union, viz:—Contract (*a*), erection of a new boiler house, chimney stack, &c.; (*b*) constructing one Lancashire steel boiler, providing steam feed and waste pipes, calorifiers, pump, injector, Berryman heater, &c. Contract (*a*), deposit 3*l.* 3*s.* Mr. J. Price Evans, Argyle Chambers, Wrexham. Contract (*b*), deposit 3*l.* 3*s.* Mr. J. Oswell Bury, clerk, 9 Temple Row, Wrexham.

TENDERS.

ADWICK-LE-STREET.

For erection of mortuary chapel and caretaker's lodge. Mr. J. SIMMONS, architect, Doncaster.

Copley	£1,720 10 6
Bevan	1,719 17 2
Drabble & Grant	1,606 0 0
Green & Sons	1,597 0 0
Sprakes & Sons	1,550 0 0
Bates	1,475 3 3
THORNTON & SON, Rotherham (*accepted*)	1,469 0 0
Bedford	1,443 0 0

BARNSLEY.

For constructing sewage tanks, &c., at Cliffe Wood and Lund Fields. Mr. HENRY TAYLOR, M.I.C.E., engineer, Barnsley.

Edwards & Co.	£4,763 5 10
Yorkshire Hennebique Co.	4,511 18 10
Bushby & Sons	4,462 3 6
Bell & Sons	4,454 9 0
Wellerman Bros.	4,406 11 2
Rhodes	4,321 0 0
Buckley	4,272 9 10
Taylor	4,203 15 7
Graham & Sons	3,881 16 7
Kaye Bros.	3,823 17 8
Bentley & Co.	3,765 0 0
Chamberlain	3,748 12 11
Sugden	3,662 5 1
Braithwaite & Co.	3,336 11 2
ELVIN & SONS, Birmingham (*accepted*)	3,284 14 0

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FRINTON-ON-SEA.

For the construction of about 360 yards lineal of concrete sea-walling and concrete block promenade (about 5,000 yards cube), together with about 70,000 yards cube of earthwork in sloping cliffs of London clay, and also soiling and draining and other works for the Frinton-on-Sea Urban District Council, Essex. Mr. E. M. BATE, surveyor.

Lawson & Son	£20,738 0 4
Ford	16,199 0 0
Kirk & Randall	15,961 0 0
Wood	14,676 19 4
Smith & Co., Ltd.	14,657 18 7
Clarke	14,625 17 6
Pedrette	14,253 19 4
Bell & Son, Ltd.	13,898 0 0
Dickson	13,207 3 5
Griffiths & Co., Ltd.	13,154 2 2
Muirhead & Co.	13,142 0 5
Contr. Eng. and Contracting Co., Ltd.	13,080 9 10
Fasey & Son	13,058 12 9
Paramor & Sons	13,005 1 7
Wright & Co.	12,776 7 4
Strachan	12,600 0 0
May	12,249 14 0
Osenton	12,201 14 3
Finnigan	11,812 17 4
Wilson & Co.	11,651 18 0
Farr	10,880 0 0
Exors. of J. Arundel, Bradford	9,957 4 10
Surveyor's estimate	11,500 0 0

HATFIELD.

For the construction of about 1¾ miles of iron and earthenware pipe sewers, with manholes, ventilators, flushing stations, tanks, bacteriological filters, the laying out of land for irrigation and sludge disposal, the formation of roads and carriers in connection with the sewage disposal of Little Heath, for the Hatfield Rural District Council. Mr. BALDWIN LATHAM, M.I.C.E., engineer, Victoria Street, Westminster.

Wimpey & Co.	£6,172 0 0
Cousins	5,717 7 11
Wood	5,674 9 5
Pedrette	5,395 15 2
Underwood & Brother	5,369 8 7
Brummell	5,239 6 8
Clements, Knowling & Co.	5,197 0 0
Stow	5,064 8 2
Osenton	5,017 19 1
Dickson	4,666 10 2
Wilson & Co.	4,593 8 2
E. & E. Iles	4,556 0 0
Cottle	4,528 16 0
Bell & Sons	4,511 0 0
Hill & Co.	4,446 0 0
Inns & Co.	4,440 0 0
Redhouse & Son	4,407 18 8
Watson	4,377 0 0
Williams	4,313 17 9
Edwards & Co.	4,118 10 11
Palmer	3,986 0 0
HARDY & Co., Woking (*accepted*)	3,958 13 0

IRELAND.

For new college, Galway. Mr. W. A. SCOTT, architect, 45 Mountjoy Square, Dublin.

Connolly & Son	£22,875 0 0
O'Flaherty	19,484 0 0
Shendon	19,084 0 0
Magure	19,371 0 0
Mackey	17,950 0 0
Emerson	17,294 0 0
Nolan	16,963 0 0
Gisk	16,855 0 0
Ryan	16,791 0 0
WYNNE, Dundalk (*accepted*)	16,117 0 0

LIVERPOOL.

For the erection of the Baptist church and schools, Waterloo. Messrs. GEORGE BAINES & SON, architects, 5 Clement's Inn, Strand, W.C.

BROWN & BACKHOUSE, Liverpool (*accepted*) £5,019 0 0

ISLE OF WIGHT.

For (1) the supply of cast-iron spigot and socket pipes and other special castings; (2) the carting of the pipes, &c., from the Town Quay, Newport, to the site, and the laying, &c., and the supply of valves, hydrants, &c., for the Town Council.

Tenders for supply of pipes for 10-inch main.

Fenestre, Cadisch & Co.	£888 10 6
Stow & Co.*	873 7 6
Jordans	637 11 2
Sheepbridge Coal and Iron Co.	628 18 11
Birtley Iron Co.	627 10 0
Cochrane & Co.	625 0 0
Clay Cross Co.	624 3 0
Macfarlane, Strang & Co.	619 19 4
Holwell Iron Co.	619 14 1
Stanton Ironworks Co.	616 17 0
Staveley Coal and Iron Co.	609 19 8
Cochrane & Co. (Woodside)	586 10 3
OAKES & Co., 21 Wharf Road, E.C. (*accepted*)	585 10 0

* This tender includes laying main.

Tenders for laying, &c., pipes.

Quinton	412 0 0
SMITH & WHITEHEAD, Pan Foundry, Newport, I.W. (*accepted*)	288 1 5
Brebner & Co.	277 19 3

LONDON.

For proposed nurses' classroom and addition to drug stores, &c., at the District Sick Asylum, Devons Road, Bromley, E. Messrs. J. & W. CLARKSON, architects, 136 High Street, Poplar.

J. Johnson	£1,188 0 0
Sharpin	898 10 0
Newell & Lusty	867 0 0
Jerram	847 0 0
Reason	797 0 0
Griggs & Son	748 10 0
W. S. & A. T. JOHNSON, Church Row, Limehouse, N. (*accepted*)	746 0 0
Weibking & Co.	740 0 0

For new buildings for the Trustees of the Barnato-Joel Charity for Cancer Research at the Middlesex Hospital, W. Mr. EDWIN T. HALL, F.R.I.B.A., F.R.San.I., architect; Mr. THOS. MOODY, F.S.I., quantity surveyor.

Foster & Dicksee, Ltd.	£49,494 0 0
Killby & Gayford, Ltd.	46,976 0 0
Trollope & Colls, Ltd.	46,120 0 0
Arnold & Son, Ltd.	45,990 0 0
Holland & Hannen	45,555 0 0
Holloway Bros.	45,300 0 0
Prestige & Co.	44,726 0 0
Waring & White (1906), Ltd.	44,629 0 0
HOLLIDAY & GREENWOOD, LTD. (*accepted*)	42,589 0 0

Exclusive of foundations.

Foundations put in by Henry Boyer at a cost of about 1,500*l*.

MAIDSTONE.

For painting, &c., at the workhouse.

Hodge	£343 10 0
Woollaston Bros.	275 0 0
Jeffery	259 0 0
Gray & Barney	253 13 0
Crundwell	250 0 0
Burrows	231 10 0
SELLICK & SON, Maidstone (*accepted*)	213 7 0

SCOTLAND.

For the erection of a practical instruction building for the School Board, Auchtermuchty.

Accepted tenders.

Wishart & Co., joiner, Kirkcaldy	£212 7 6
Somerville, mason, Cowdenbeath	145 13 7
Binning, plumber, Cowdenbeath	142 0 0
Hood & Sons, plasterer, Kirkcaldy	47 8 8
Currie, slater, Kirkcaldy	40 9 0
Rafferty & Son, painter, Strathmiglo	10 17 9
Carron & Co., glazier, Kirkcaldy	6 9 8

WORCESTER.

For the erection of Nos. 43 and 44 High Street, for the Corporation.

PHELPS & JOHNSON, Worcester (*accepted*) . £2,370 0 0

There were six tenders.

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Town Hall; (2) repairs to the interior of the old police station, Market Square; (3) erecting shed for fire escape at Branksome depot; (4) painting to exterior of Lodge, Parkstone Cemetery; (5) painting to exterior of Heatherlands school, Branksome Heath school, and Oakdale school; (6) provision of one single and one pair of wrought iron gates at Alderney Isolation Hospital. Mr. Samuel J. Newman, F.R.I.B.A., borough surveyor, Municipal Offices, Market Street, Poole.

REDRUTH.—Sept. 26.—For the erection of a bungalow residence at North Country. Mr. Morley B. Collins, architect, Clinton Road, Redruth, Cornwall.

ROTHERHAM.—Oct. 4.—For erection of a balcony, &c., at the swimming baths, Market Street. Mr. Ernest B. Martin, A.M.I.C.E., borough engineer, Town Hall, Rotherham.

SCOTLAND.—Oct. 8.—For the mason, joiner, slater, plumber, plaster, glazier, and painter works required in the erection of a police station at Bridge of Earn. Messrs. Smart & Stewart, architects, 42 Tay Street, Perth.

SEAFORD (SUSSEX).—Oct. 5.—For the supply and erection—subject to the sanction of the Local Government Board being obtained for the loans—of a two-cell destructor and boiler, in a building to be constructed by the Council at their sewage pumping station. Deposit 2*l.* 2*s.* The Offices of the Council, or Messrs. Pollard & Tingle, engineers, 31 Old Queen Street, Westminster, S.W.

SHEFFIELD.—Sept. 29.—For erection of new galleries and structural alterations at Brightside and Park Baths. The City Architect, Town Hall, Sheffield.

SITTINGBOURNE.—Sept. 26.—For providing and laying a hard-wood floor at the Gymnasium, for the Sittingbourne Urban District Council. Mr. W. Leonard Grant, surveyor, Sittingbourne.

SOUTHALL.—Oct. 4.—For the following, for the Southall Norwood Urban District Council, viz.:—(*a*) Boiler house; (*b*) hot-water heating; (*c*) hot-water supply at the sanatorium; and (*d*) paving works; and (*e*) channelling work. Mr. Reginald Brown, A.M.I.C.E., F.S.I., &c., engineer and surveyor, Public Offices, Southall, Middlesex.

SOUTHAMPTON.—Oct. 6.—For the enlargement of the pavilion, Royal Pier, for the Southampton Harbour Board. Deposit 1*l.* 1*s.* Mr. E. Cooper Poole, A.M.I.C.E., engineer and surveyor to the Board, Harbour Offices, Town Quay, Southampton.

STANWAY.—Oct. 6.—For erection of a new school at Stanway, Essex, for 260 children, for the Lexden and Winstree district sub-committee. Send names and 3*l.* 3*s.* deposit by Oct. 6 to Mr. J. W. Start, F.S.I., architect, High Street, Colchester.

SWARBY (LINCS.).—Oct. 3.—For erection of a Primitive Methodist chapel, at Swarby. Mr. G. W. Cooper, architect and surveyor, Sleaford.

SYDENHAM.—Oct. 4.—For building a boundary wall at the Home Park Depot, Lower Sydenham, for the Lewisham Borough Council. Surveyor's Department, Town Hall, Catford.

THORNE MOORENDS.—Sept. 30.—The West Riding Education committee invite whole or separate tenders for the following works, in connection with alterations and additions to Thorne Moorends Council school, viz.:—Builder, joiner, slater, plumber, plasterer, painter. The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

WELLINGTON.—Sept. 24.—For erection of a secondary school to accommodate 200 pupils at Wellington, Salop. Messrs. Shayler, Swan & Ridge, joint architects, 16 Pride Hill, Shrewsbury. Send 3*l.* 3*s.* deposit to Mr. W. Windsor, quantity surveyor, 37 Brown Street, Manchester.

WEST VALE.—Sept. 24.—For joiner, plumber, plasterer, and slater works required in four through houses at Woodside, West Vale, Halifax. Mr. F. F. Beaumont, architect, Southgate Chambers, Halifax.

WALES.—Sept. 24.—For erection of a dwelling-house, coach-house and stable at Cefn Coed. Mr. R. Cound Jenkins, C.E., architect and surveyor, Cefn Coed.

WALES.—Sept. 26.—For proposed new bakery, Nantymoel, for the Nantymoel Industrial Co-operative Society, Ltd. Send names and qualifications on or before Sept. 26, to the Chairman, Co-operative, Nantymoel.

WALES.—Sept. 26.—For the provision and erection of iron classrooms at Ynyswen (Glam.), for the Rhondda Urban District Council. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WALES.—Sept. 27.—For erection of thirty houses at Penygraig for the Hendrecafn Building Club. Mr. Moses Thomas, auctioneer, Penygraig; or Mr. Edward Rees, Taff Street, Pontypridd.

WALES.—Sept. 27.—For erection of drill-hall and quarters at Treharris, for the 5th Batt. the Welsh Regiment. Mr. William Dowdeswell, M.S.A., architect, Treharris.

WALES.—Sept. 28.—For the rebuilding of the Fox and Hounds Inn, and three shops at Troedyrhiw. Mr. C. M. Davies, M.S.A., 112 High Street, Merthyr.

WALES.—Sept. 29.—For erection of Wesleyan Church at Ely, near Cardiff. Deposit 2*l.* 2*s.* Mr. H. P. Sanders, architect, 10 Windsor Place, Cardiff.

WALES.—Oct. 1.—For erection of a hall at Church Village, near Pontypridd, for the Efail Isha Congregational Church. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and engineers, Pontypridd.

WALES.—Oct. 1.—For erection of fifteen houses at Pontyclun, for the Pontyclun Building Club. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and engineers, Pontypridd.

WALES.—Oct. 1.—For building a school (accommodation 500) at Hendy, Pontardulais, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., County Architect, County Education Offices, Carmarthen.

WALES.—Oct. 4.—For erection of branch premises at Talywain, Mon., for Messrs. the Abersychan, British and Talywain Industrial Co-operative Society, Ltd. Mr. A. Gordon Babbidge, architect and surveyor, Clarence Chambers, Pontypool.

WIGTON (CUMBERLAND).—Sept. 26.—For the laying down of maple floor at the swimming bath, Mr. Joseph W. Crookes, clerk.

WORSBROUGH DALE.—Sept. 24.—For additions to the conveniences of the infants' school. Mr. Arthur Whitaker, architect, Kingwell Close, Worsbrough Dale, Yorks.

WREXHAM.—Sept. 28.—For the following works, for the Guardians of Wrexham Union, viz:—Contract (*a*), erection of a new boiler house, chimney stack, &c.; (*b*) constructing one Lancashire steel boiler, providing steam feed and waste pipes, calorifiers, pump, injector, Berryman heater, &c. Contract (*a*), deposit 3*l.* 3*s.* Mr. J. Price Evans, Argyle Chambers, Wrexham. Contract (*b*), deposit 3*l.* 3*s.* Mr. J. Oswell Bury, clerk, 9 Temple Row, Wrexham.

TENDERS.

ADWICK-LE-STREET.

For erection of mortuary chapel and caretaker's lodge. Mr. J. SIMMONS, architect, Doncaster.

Copley	£1,720 10 6
Bevan	1,719 17 2
Drabble & Grant	1,606 0 0
Green & Sons	1,597 0 0
Sprakes & Sons	1,550 0 0
Bates	1,475 3 3
THORNTON & SON, Rotherham (*accepted*)	1,469 0 0
Bedford	1,443 0 0

BARNSLEY.

For constructing sewage tanks, &c., at Cliffe Wood and Lund Fields. Mr. HENRY TAYLOR, M.I.C.E., engineer, Barnsley.

Edwards & Co.	£4,763 5 10
Yorkshire Hennebique Co.	4,511 18 10
Bushby & Sons	4,462 3 6
Bell & Sons	4,454 9 0
Wellerman Bros.	4,406 11 2
Rhodes	4,321 0 0
Buckley	4,272 9 10
Taylor	4,203 15 7
Graham & Sons	3,881 16 7
Kaye Bros.	3,823 17 8
Bentley & Co.	3,765 0 0
Chamberlain	3,748 12 11
Sugden	3,662 5 1
Braithwaite & Co.	3,336 11 2
ELVIN & SONS, Birmingham (*accepted*)	3,284 14 0

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FRINTON-ON-SEA.

For the construction of about 360 yards lineal of concrete sea-walling and concrete block promenade (about 5,000 yards cube), together with about 70,000 yards cube of earthwork in sloping cliffs of London clay, and also soiling and draining and other works for the Frinton-on-Sea Urban District Council, Essex. Mr. E. M. BATE, surveyor.

Lawson & Son	£20,738 0 4
Ford	16,199 0 0
Kirk & Randall	15,961 0 0
Wood	14,676 19 4
Smith & Co., Ltd.	14,657 18 7
Clarke	14,625 17 6
Pedrette	14,253 19 4
Bell & Son, Ltd.	13,898 0 0
Dickson	13,207 3 5
Griffiths & Co., Ltd.	13,154 2 2
Muirhead & Co.	13,142 0 5
Contr. Eng. and Contracting Co., Ltd.	13,080 9 10
Fasey & Son	13,058 12 9
Paramor & Sons	13,005 1 7
Wright & Co.	12,776 7 4
Strachan	12,600 0 0
May	12,249 14 0
Osenton	12,201 14 3
Finnigan	11,812 17 4
Wilson & Co.	11,651 18 0
Farr	10,880 0 0
Exors. of J. Arundel, Bradford	9,957 4 10
Surveyor's estimate	11,500 0 0

HATFIELD.

For the construction of about 1¾ miles of iron and earthenware pipe sewers, with manholes, ventilators, flushing stations, tanks, bacteriological filters, the laying out of land for irrigation and sludge disposal, the formation of roads and carriers in connection with the sewage disposal of Little Heath, for the Hatfield Rural District Council. Mr. BALDWIN LATHAM, M.I.C.E., engineer, Victoria Street, Westminster.

Wimpey & Co.	£6,172 0 0
Cousins	5,717 7 11
Wood	5,674 9 5
Pedrette	5,395 15 2
Underwood & Brother	5,369 8 7
Brummell	5,239 6 8
Clements, Knowling & Co.	5,197 0 0
Stow	5,064 8 2
Osenton	5,017 19 1
Dickson	4,666 10 2
Wilson & Co.	4,593 8 2
E. & E. Iles	4,556 0 0
Cottle	4,528 16 0
Bell & Sons	4,511 0 0
Hill & Co.	4,446 0 0
Inns & Co.	4,440 0 0
Redhouse & Son	4,407 18 8
Watson	4,377 0 0
Williams	4,313 17 9
Edwards & Co.	4,118 10 11
Palmer	3,986 0 0
HARDY & Co., Woking (*accepted*)	3,958 13 0

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Currie, slater, Kirkcaldy	40 9 0
Rafferty & Son, painter, Strathmiglo	10 17 9
Carron & Co., glazier, Kirkcaldy	6 9 8

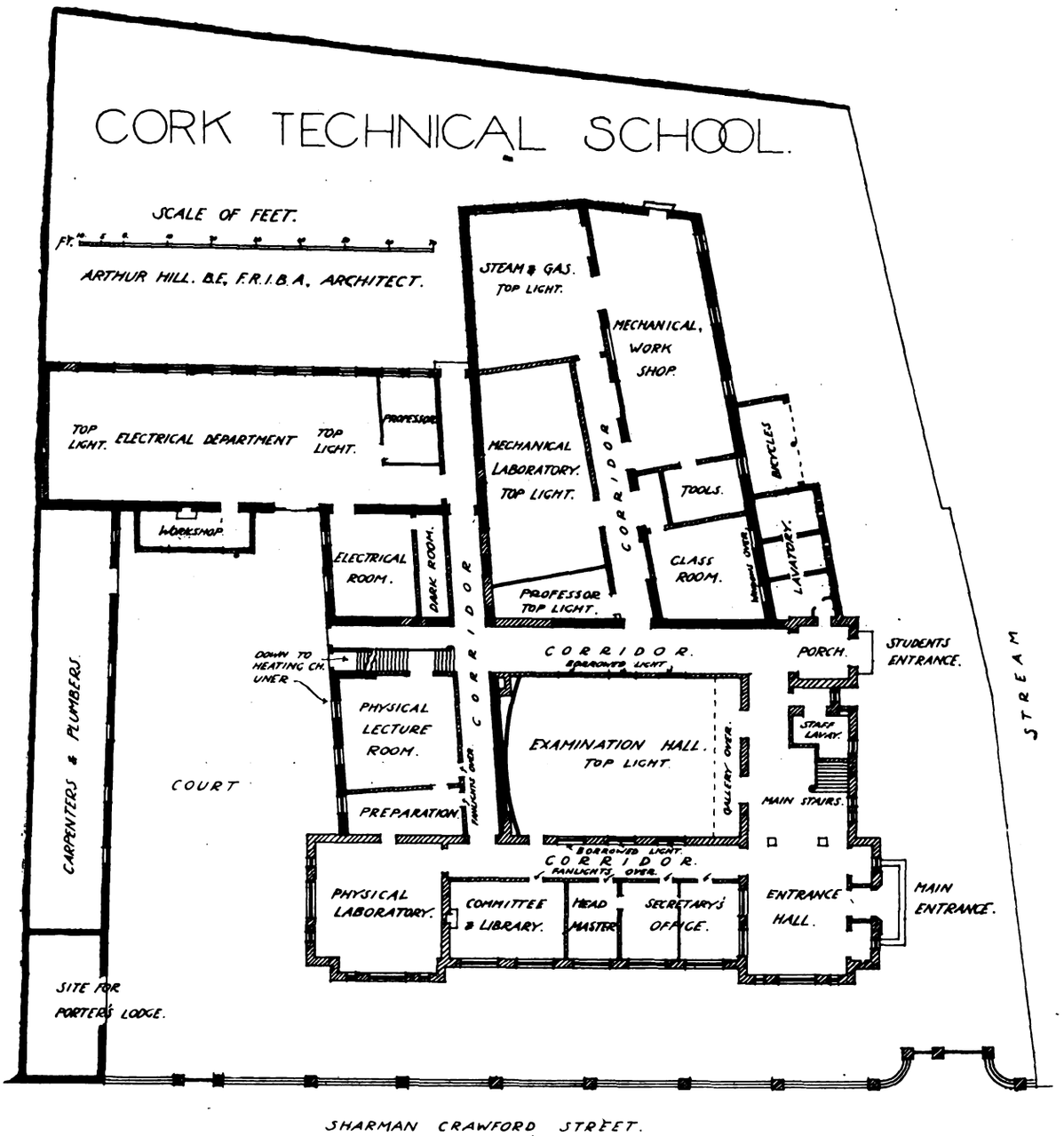
WORCESTER.

For the erection of Nos. 43 and 44 High Street, for the Corporation.

PHELPS & JOHNSON, Worcester (*accepted*) £2,370 0 0

There were six tenders.

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CORRESPONDENCE.

Gidea Park Town Planning Exhibition.

SIR,—We should be much obliged if you would kindly insert the enclosed memo., which will answer a very large number of inquiries which we have received with regard to the exhibition.—Yours faithfully,

September 20, 1910. M. BUNNEY, Hon. Secretary.

In answer to a number of inquiries, this is an exhibition of houses and not of plans. The prizes of 250*l*., 200*l*., 100*l*., and 100*l*. for architects will be given to the architects of the best houses actually built. The plans themselves will not be judged, though they must be submitted for approval (on or before October 31) before actual building commences.

The houses may be built by the architect, or his client, or by the builder. In any case the land is provided at special rates for the purpose (at 25 per cent. below the scheduled prices on the suburb), and the directors of the Romford Garden Suburb have agreed to provide at least three-fourths of the cost of erection, including architects' fees and builders' profit. The plans of all houses remain the property of the architects, and repeats on the suburb will be paid for at the ordinary professional scale.

The following memo. for the guidance of competitors has been issued with the approval of the judges:—

"Competitors should aim at providing cottages convenient and comfortable to live in, and straightforward in plan and arrangement.

"Anything in the nature of ingle nooks, cosy corners, or features of such kind, if adopted, should be simple and structural in character and treatment.

"The cottages should rely for their effect on proportion and design, rather than ornament, neither imitating the larger houses on the one hand, nor the purely rustic cottage on the other.

"Having regard to the fact that in urban districts houses must of necessity be close together, it is desirable that as far as practicable uniformity of effect should be aimed at, and that any quaint or eccentric features, or such as call for particular notice, should be avoided.

"It would be desirable, therefore, that all the windows should be wood and painted white, and that leaded lights be avoided."

THE Tees Bridge and Engineering Works, Ltd., Middlesbrough, have been awarded a contract for the supply of the heavy steelwork in connection with the foundations of a bridge to be built for the Eastern Bengal State Railway over the Ganges, 120 miles from Calcutta. This contract amounts to about 80,000*l*., and the total cost of the undertaking is estimated at 1,300,000*l*. The bridge will consist of fifteen spans, and a total length of 5,610 feet.

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SPECIMENS OF WORK AT THE SCHOOL OF ART WOODCARVING, SOUTH KENSINGTON (see p. 199).

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NEW CATALOGUES.

WE have received from Messrs. Messenger & Co., Ltd., horticultural builders, heating engineers and founders, Loughborough, a compact catalogue which deals exclusively with their two last-named departments. A considerable number of pages are devoted to the "Quorn" boilers, which, with all the firm's sectional boilers, are machined by means of special tools and made with all sections interchangeable. Another prominent boiler is the "Loughborough," which is made in a variety of patterns. Illustrations are given of various radiators, connections, valves, and boilers. The firm have the advantage of over half a century's experience in the manufacture of hot-water pipes and as heating engineers, and their work has gained for them a place on many important contracts, including the lists of H.M. Office of Works, the Admiralty, War Office, and the London County Council.

A 70-PAGE supplementary Architectural Catalogue has been brought out by the Carron Company for the purpose of illustrating some of the gates, railings, verandahs, porches, balconies, external and internal stairs, columns, crestings, &c., which are turned out from their works. Besides being ready to execute every kind of order in such structural features, the company have a special staff for carrying out the actual erection on any selected site. The catalogue gives, so to speak, a detailed specification of each of the objects illustrated; for instance, on page 26 is No. 301 shelter. This consists of "Six No. 34 columns 3½ inch diameter, with spandril shafts, 9 feet overall; six No. 159 cast-iron railing panels fixed between bases of columns; six No. 93 panels between spandril shafts, and two No. 92 brackets." This method allows a free play to individual fancy in the combination of the parts. The available patterns for fire escapes are described as entirely new and up-to-date, and specially adapted for the present market. In such goods as terminals, crestings, and railings there is a commendable taste displayed.

THE Jubilee edition of Mr. H. Morell's illustrated trade list is an imposing production of nearly two hundred pages, every one of which is filled with a variety of different patterns of picture frames and mouldings. The size is not, of course, surprising when one remembers that ever since the business was established in 1860 it has been steadily progressing until now the stock is the largest in the kingdom, and probably it cannot be equalled in the world. In the past half century the making of picture frames has become an art in itself. The catalogue shows many exclusive designs and new patterns are continually being added. The reproductions, with sections in the book, are the exact size of the mouldings, with the exception of the white ornamental frames (for gilding, &c.), and the compo white ornaments which are reduced to scale. Mention might be made of the "Best Washable Gilt Alhambra and Ornamental Picture Frame Mouldings," and the "Inlaid Sheraton Polished Mouldings." Mr. Morell, it may be added, is ready to supply from his large warehouses in Neal Street, W.C., and his offices in Great Andrew Street, Bloomsbury, all the requisites of the trade, including English and foreign glass and mitre-cutting and mount-cutting machines.

"EVERYTHING for the Telephone" seems to describe best the new catalogue of telephone apparatus and supplies issued by the Western Electric Company, Ltd., North Woolwich. It must certainly be one of the most complete descriptive catalogues dealing exclusively with this line of goods ever published. All the most recent improvements in such instruments are illustrated and concisely described. Special prominence is accorded to the central battery system. In the introduction of this the Western Electric Company were the pioneers, and they have contributed largely to its ultimate triumph. The essential difference between this and the magneto-telephone system is that in the former the energy is supplied by a single large battery from the central exchange, while in the latter each subscriber's telephone is provided with a battery and a hand generator for talking and signalling purposes. This last method has undoubted advantages when the installation is less than 450 lines. Apparatus for both systems is manufactured by the company, to whom no detail is too small or too large. This extremely useful and complete catalogue includes a telegraph message code, a code word index and a detachable price list. The company have had thirty years' experience on which to draw in putting on the market the best of everything.

WILLIAM MORRIS & Co. (Ruskin House), Ltd., have so completely achieved the proud task of converting a trade catalogue into a work of art that the result might almost be criticised as being too ornamental. Their 200-page charmingly bound, beautifully printed, and artistically illustrated volume must strike every possessor as being too good to be placed cheek by jowl with the ordinary trade list, and rather calling for an honoured place in the home. Perhaps the most suitable destination for it is the office table, where it can instruct and entertain the waiting client. It is said of Wordsworth, we believe, that, as a preliminary to seriously embarking on the production of poetry, he devoted many months to a most exhaustive study of the English Dictionary. In a similar way the mind of the prospective house owner may be tuned up to a higher artistic pitch by dipping into this book, which is an object-lesson in harmony. It is, however, unfair to consider it exclusively as an example of the printer's art, for that is not the purpose of its production. The catalogue is in three sections:—(1) Window casements, (2) architectural metalwork, and (3) glazing. At Ruskin House, Rochester Row, Westminster, S.W., the firm have 25,000 superficial feet of floor area where the various crafts are carried on under ideal conditions, and here the architect can watch the realisation of his own, or the designs of other people in the most approved way. Of the excellence of the work, the catalogue (if this word must be used) bears witness, and that excellence is not due to, but only enhanced by, the way in which it is here presented.

MESSRS. JOHN BROTHERTON, LTD., Imperial Tube Works, Wolverhampton, have brought out a revised price-list, which is noteworthy for its compactness. It deals with tubes, coils, and fittings for gas, water, steam, and all other engineering purposes. At the end of the list there will be found a useful series of tables and approximate weights, &c. It may be of interest to mention that the firm will be keeping their jubilee next year, as they were established in 1861.

THE first speciality mentioned in the catalogue of Thomas W. Robinson, Ltd., Dennis Park Iron Works, Stourbridge, is their improved "Expansion Joint" for hot-water pipes. As far back as 1880 a user wrote of it:—"I consider it to be the cheapest, most easily put together, removed, and the best." Since that time upwards of two millions have been sold. The joint being simply made with two indiarubber rings fitting in flanges and screwed together by two bolts, it can be put together without the assistance of a fitter. Another success is the well-known "Dennis" boiler, separate parts of which are obtainable for renewals. There are also the "Acme" sectional boilers and radiators for low-pressure hot-water heating. In fact, every description of builders' iron work is made at the Dennis Park Ironworks. Particular reference may be made to the lavatory flushing pipes and fittings, and the rain-water and soil pipes. Separate leaflets are issued in connection with these, giving prices, sizes, and patterns.

TRADE NOTES.

MR. HERBERT MEASURES, iron and steel contractor and engineer, of 4 Exchange Parade, Southwark Street, London, S.E., is removing to more commodious offices at 110 Cannon Street, London, E.C.

MESSRS. SMITH & PAGET, of the Crown Works, Keighley, have been awarded two gold medals for their exhibit of laundry machinery, and a silver medal for agricultural machinery at the International Exhibition being held at Brussels.

VARIETIES.

THE Royal Drawing Society's Scholarship has been awarded to Miss Ursula Woodd.

A CO-PARTNERSHIP tenants' company is now being formed at Newcastle, with Lord Howick at the head, for establishing a garden city on seventy acres of the large Corporation estate at Walker. The accommodation will be required for the men at the new shipyard of Messrs. Armstrong, Whitworth & Co.

IN connection with the scheme for the reconstruction, widening, and extending of Rhyl Pier, plans and details are now being prepared for the provision of open-air sea-water swimming baths, so that bathing can be indulged in at all stages of the tide and in all weather. The architects to the whole scheme are Messrs. Maxwell & Tuke.

THE Urban District Council of Consett have approved of a scheme of outfall sewerage and sewage disposal prepared by Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne. The work consists in laying several miles of sewers to intercept sewage which at present discharges into the sewers of the Benfieldside Urban District Council, and also to provide adequately for a portion of the district which is

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now being rapidly built on. At the disposal works it is proposed to purchase 80 acres of additional land, including farm buildings, which will permit of the treatment of the sewage not at present dealt with there. The Council have decided to apply to the Local Government Board for sanction to a loan for the works, amounting to 16,000*l.*

A BUILDING trades exhibition will be held in the Artillery Drill Hall, Sheffield, from October 14 to 22, which will be under the patronage of the Sheffield Master Builders' Association, the Sheffield Society of Architects and Surveyors, and the Yorkshire Federation of Building Trades Employers. The exhibition will be under the management of Mr. George Stanley, who for nearly twenty years has been connected with successful trade and industrial exhibitions in some of the largest cities in the provinces. The honorary Executive Committee consists of Messrs. W. Longden (president of the Sheffield Master Builders' Association), J. Biggin, A. J. Forsdike, J. D. Cook, T. Roper, G. E. Powell, T. Eshelby, W. W. Mears (past presidents), Charles Boot (vice-president), A. T. Biggin (treasurer), and Thomas Smith (secretary).

THE Warrington Education Committee recently asked the Board of Education to sanction the building of a new school and baths in Evelyn Street, one of the populous parts of the town. The Board sanctioned the school, but refused to sanction the inclusion of the baths. At a meeting on Monday, however, the Committee was informed that the Board was now prepared to consider on their merits proposals for the provision of shower, douche, and spray baths. It was also announced that the Local Government Board had sanctioned a loan of 14,910*l.* to cover the cost of the school. The committee resolved, accordingly, that the architect for the Evelyn Street Council School be instructed to prepare a plan of the desired douche baths, a specification, and estimate of the cost. At the same meeting the Sites and Buildings Sub-committee recommended the adoption of a site for a public elementary school in Parr Street to accommodate, in the first instance, 420 girls, together with a cookery centre, and subsequently 420 boys and 420 infants, together with a handicraft centre. The Town Clerk was instructed to enter into negotiations to secure the land. It was also decided to erect an additional department to the Bolton Council School to accommodate 420 boys.

FAIR WAGES CLAUSE IN EDINBURGH.

SOME time ago there was remitted to a sub-committee of the Plans and Works Committee of Edinburgh Town Council a motion by Councillor Young in order that they might consider and report as to whether any alterations should be made on the fair wages clause in city contracts. The clause as at present inserted in city contracts is as follows:—"We hereby declare that in the execution of this contract we will pay the standard rate of wages, or such wages as are generally accepted as fair in the trade." After consideration, the sub-committee decided to recommend that in future the following clause be inserted in all specifications for city contracts in lieu of the present contract:—

"We hereby declare that in the execution of this contract we shall pay the standard recognised rate of wages, or such rate of wages as are generally recognised as fair in the district where the work is executed. No portion of this contract shall be transferred without the written consent of the Town Council. Sub-letting, other than that which is customary in the trades concerned, is prohibited. The contractor hereby gives an assurance that, during the three months immediately preceding the date of his tender for this contract, he has paid the whole of his workpeople not less than the standard rate of wages as above defined. For the purpose of ascertaining whether the contractor is or has been paying the standard rate of wages, the contractor shall, whenever called upon by the Town Council, submit his wage-books to such accountant as the Town Council shall direct at such time or times as the Council may think fit. In the event of this fair wages clause being broken in any particular, the contractor shall be bound to refund to his workpeople the difference between the amount paid to them and the standard rate of wages, and the Town Council shall be entitled to deduct the amount of the accountant's fee and any other expenses caused through the breach of this clause. And the Town Council declare that no further tender from any persons or firms who have contravened this fair wages clause shall be considered for a period of five years from the date of such contravention."

At a meeting of the Plans and Works Committee held last week the proposed alteration was approved, and recommended for adoption by the Town Council.

THE HOUSING, TOWN PLANNING, ETC., ACT, 1909, FROM THE SANITARY INSPECTORS' POINT OF VIEW.*

IN considering the Housing, Town Planning, &c., Act, 1909, from the sanitary inspectors' point of view, an anomaly at once presents itself in the fact that the sanitary inspector or inspector of nuisances is never specifically alluded to as an administrative officer. Is this because his prospective duties under the Act were so few and of so little importance that he may be regarded as a negligible factor in its operation? I, for one, do not think so, and the provisions alluded to hereafter will give the reasons for my opinion. What, then, are the provisions which are likely to be of special interest to the sanitary inspector so far as their effect on his future work is concerned? They may be appropriately classified as follows:—

I. Increased power of entry to premises.

II. The simplification of procedure in order to secure the closure, and, if necessary, the demolition of houses unfit for human habitation.

III. The power to take action against owners of dilapidated and defective property which previously could not, or could with extreme difficulty, be dealt with.

IV. Other provisions of the Act of general interest to the sanitary inspector.

I. *Power of Entry.*—This is provided for by Sections 36 and 15 (2). The former section gives right of entry, at all reasonable times, to any person authorised in writing by the local authority to enter any house, &c., for the purpose of survey and examination in order to determine whether any powers under the Housing Acts should be exercised. Again, by Section 15 (2), a local authority may authorise the entry of any person to houses, &c., under a certain rental (see Section 14), "for the purpose of viewing the state and condition thereof." It is thus evident that, under the provisions of these two sections, an officer of a local authority has now powers of entry which will enable him to carry out house-to-house inspection in his district without the risk of an undignified retreat in cases where an obstructive tenant or property owner is met with. It should be noted, however, that where admission to premises is refused, and resource to the legal demand of right of entry thus necessitated, the procedure somewhat differs according to the section under which the action is taken—*i.e.*, under Section 15 (2), twenty-four hours' notice to the tenant or occupier is required to be given, whereas under Section 36 notice must be given to both occupier and owner if the latter is known.

The value of these new powers can scarcely be over-estimated, especially when we consider the totally inadequate powers we previously possessed. Although by Section 32 of the principal (1890) Act it was the duty of all local authorities to make periodical inspection of their district with a view to ascertaining the existence of houses unfit for human habitation, the only right of entry given to the executive officer was under the provisions of Section 102 of the Public Health Act, 1875, and this was totally unsatisfactory, as it could only be used for "the purpose of examining as to the existence of any nuisance on the premises dealt with. This lack of powers as to right of entry made the work of inspection a task demanding, in many cases, a considerable amount of tact.

II. *Simplification of Procedure in Securing* (a) *the Closure and* (b) *Demolition of Houses.*—(a) The procedure in order to secure the closure of houses unfit for human habitation has been entirely remodelled by reason of Section 17 (2) of the Act. This section provides that if any dwelling-house is, in the opinion of the local authority, in such a state as to be unfit for human habitation, the local authority may themselves make a closing order, notice of which must be served on the owner. Unless the owner appeals to the Local Government Board, the closing order becomes "operative" in fourteen days, and the local authority must then serve "notice to quit"—not exceeding fourteen days—on all occupying tenants. Except in cases where the dwelling-house has been made unfit for habitation by the wilful act or default of the tenant, a local authority may make reasonable allowance to displaced tenants on account of removal expenses, any such expenditure being recoverable as a civil debt from the owner.

* Abstract of a paper read before the Sanitary Inspectors' Association by Mr. Walter Smith, Sanitary Inspector, Northumberland County Council, on August 31, at their twenty-fifth annual conference held in Fishmongers' Hall, London Bridge, E.C.

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A closing order remains operative until determined (*i.e.*, cancelled) by the local authority, who are required to do so when they are satisfied that the house has been rendered fit for human habitation.

The effect of these provisions is that the power to make closing orders is now transferred from courts of summary jurisdiction to local authorities, and the appeal against closing orders is to the Local Government Board, whereas formerly, it was to Quarter Sessions. How will this affect the sanitary inspector? In the first place, it will greatly facilitate the obtaining of these orders, as, formerly, two processes were necessitated:—(1) a report to the sanitary authority, and (2) proceedings before the court. The latter, which required a considerable amount of time and care in preparing evidence, &c., is now dispensed with, and the work of the sanitary inspector in obtaining closing orders is correspondingly facilitated Secondly, the reports of the sanitary inspector as to houses unfit for human habitation will now be considered and adjudicated upon by a body of men who have been selected by their fellow citizens to administer, amongst other statutes, the various Public Health Acts, and who in many cases have had years of experience in the carrying out of this work. I think it is beyond question that these men are far more fitted to decide as to what measures are requisite in order to clear a district of its plague spots in the shape of houses unfit for human habitation than a bench of magistrates who occupy that position more often than not as a result of allegiance to one or other political party, and whose members are largely recruited from the property-owning classes.

(B) *Demolition Orders.*—When a closing order has been made, and has remained operative for three months, the local authority must proceed to take action with a view to the demolition of the dwelling-house. One month's notice must be given to the owner of the time and place when the matter will be considered. If the local authority are then of opinion that (1) the house has not been rendered fit for human habitation; (2) that the necessary steps are not being taken; and (3) that the continuance of the building is a nuisance, or dangerous to the public, &c., they shall order its demolition. In the event of the owner undertaking to carry out the necessary works forthwith, the local authority may postpone the operation of a demolition order for a period not exceeding six months. Further proceedings as to demolition orders are set out in Section 34 of the 1890 Act, which is somewhat amended by Schedule II. of the 1909 Act.

When comparison is made with the procedure which was previously necessary—under Section 33 of the 1890 Act—in order tosecure the demolition of houses, the simplification will be seen to be very appreciable. Further, the maximum time allowed for the carrying out of the necessary works is definitely fixed, and cannot be enlarged by a court of summary jurisdiction as was formerly the case.

The simplification of procedure in obtaining closing and demolition orders may, however, if unduly made use of, lead to very undesirable results, as it must be borne in mind that the closure of houses involves the removal of tenants, and in many cases will be followed by demolition. An excessive zeal on the part of a local authority in this direction, more especially in a district where the housing accommodation is barely sufficient for the needs of the people, may result in such a decrease as to give rise to conditions of overcrowding and its concomitant evils, quite as prejudicial to health as the conditions which the over-zealous authority were desirous of remedying. This is a possible effect which ought to be borne in mind by the sanitary officer in all cases where his intervention is necessitated.

III.—*Powers to Take Action Against the Owners of Dilapidated and Defective Property.*—In all contracts made after the passing of the Act (December 3, 1909) for the letting of houses under a certain rental (varying from 40*l.* to 16*l.* per annum in different districts), it shall be implied that the house is in all respects reasonably fit for human habitation. (Section 14.) These contracts also imply an undertaking on the part of the landlord that the house shall be kept in all respects reasonably fit for human habitation. (Section 15.) If a local authority are of opinion that the implied undertaking is not carried out by the landlord they may either (*a*) make a closing order, or (*b*) require the landlord, by notice served upon him, to make the house in all respects reasonably fit, &c.

If the notice is not complied with, and (*a*) the local authority do not make a closing order, or (*b*), the landlord has not declared his intention of closing the house, the local authority may do the work required, and recover the cost either as a civil debt, or by annual instalments, 5 per cent. interest being charged in the latter case. If, however, the landlord, within twenty-one days, gives notice of his intention to close the house, a closing order is deemed to have become operative. For the purposes of this section the words "landlord" and "house" are specially defined. (See Sub-section 7.)

The powers given by these two sections (14 and 15) will, in my opinion, be of more practical use to the sanitary inspector than any of the other provisions of the Act. An estimate of their value will, however, be dependent to a considerable extent upon the interpretation of the words "in all respects reasonably fit for human habitation." Experience teaches us that the standard of what some authorities regard as being fit for human habitation is considerably lower than the one set up by other and often adjoining authorities. Many examples may without difficulty be found of closing orders having been obtained for houses in certain districts which were appreciably superior to houses in adjoining districts, while with regard to the latter no action has been taken. Some uniformity of action in making use of the provisions I am alluding to is particularly desirable, and I know of no better means of securing it than by a discussion amongst a representative body of health officials as to what interpretation can and ought to be placed on the words "in all respects reasonably fit for human habitation." Many conditions of defect and dilapidation will now come within the possibilities of the Housing Acts which previously could not, or could with extreme difficulty be dealt with. Any inspector who has had experience in the inspection of houses occupied by the poorer classes must frequently have encountered many conditions which could not separately be dealt with under the Public Health Acts, and which were, collectively, hardly so bad as to justify him in reporting to his authority that the house was unfit for human habitation. To enumerate a few of the conditions I would mention dilapidated ceilings and internal walls, owing to which the requisite periodical cleansing is almost, if not absolutely, impossible; dilapidated window sashes and cords, which necessitate in stormy weather their permanent fixing by nails, &c., and thus totally prevent their use as a means of ventilation; dilapidated fire ranges or defective chimney flues, owing to which it may be impossible to cook any food in the house; dilapidated floors, which are especially dangerous if young children or elderly people are in the house, and which also prevent effectual cleansing; absence of pantry accommodation; inaccessibility of the water supply, whereby a distinct premium is put on cleanliness—*e.g.* a tenant of a tenement house may have to carry all the water used up three or four flights of almost perpendicular stairs, or, as in the case of several of our mining villages in the North, water may have to be carried a considerable distance along roads which in winter are seas of mud; houses unprovided with proper bedroom accommodation.

(*To be concluded.*)

THE Doncaster Rural District Council have adopted the general report prepared by Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne, for a further extension of the sewerage system of the rapidly rising district of Bentley (Doncaster), so as to deal with the sewage from houses on the Askern Road beyond the toll bar. This work will require the laying of considerable lengths of cast-iron pipes embedded in concrete, and also the construction of a storage tank with pumping station. The engineers have been instructed to prepare detailed plans for the carrying out of the work.

THE Stirling Town Council have decided that a post-card plebiscite should be taken of all the voters on the voters' roll as to whether they were in favour of new municipal buildings being erected, or if they were against such a scheme going on. The voters are to be asked to vote on two sites, the Corn Exchange site (at a cost of 14,500*l.*), and the top of King Street site (at a cost of 20,020*l.*). In the first case the sum to be borrowed would be 4,600*l.* (annual cost 256*l.* 14*s.* 2*d.*), in the latter case 11,400*l.* (annual cost 708*l.* 9*s.* 2*d.*). October 4 has been fixed at the day for returning the voting cards.

THE committee arranging the memorial to King Edward VII. in Liverpool, after considering a number of other sites, are desirous of having a site for the proposed memorial at the south end of St. George's Hall. A model has been prepared by Mr. Goscombe John, showing the proposed position of the statue and alterations to the present plateau by the addition of steps leading from St. John's Lane.

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Cathedrals and Abbeys of England—continued.

CHESTER.

View from South-East	January 1, 1904
Tower, Flying Arches and Buttresses	January 15, 1904
Mosaics in Aisle	January 29, 1904
The Cloisters. Doorway in Cloisters	February 12, 1904
The Choir	March 25, 1904
Detail of Choir Stalls	April 1, 1904
The Sedilia. Reader's Pulpit in Refectory	April 15, 1904
The Crypt	April 22, 1904
The Nave, looking North-East ...	April 29, 1904
Vestibule to Chapter-House. Window and Door at South End of West Aisle of South Transept	May 6, 1904
General View of Nave	May 20, 1904
South Cloister. The Cloisters ...	May 27, 1904
West End of South Wall of Refectory, and North-West Angle of Cloisters	June 3, 1904
Clerestory of Nave and Flying Buttresses. North-West Porch and Base of North-West Tower. Doorway at West End of Nave. Abbey Gateway	June 10, 1904
General View of Choir	June 17, 1904
North-East View	June 24, 1904
The Chapter-House	July 1, 1904
South Aisle, The Pulpit	July 15, 1904
The Crossing, looking North-East	July 22, 1904
The Reredos...	July 29, 1904
The Cloisters	August 5, 1904
North-East View. North Transept, with Tomb of Bishop Pearson	August 12, 1904

BANGOR.

General Exterior (South Side) ...	August 19, 1904
Chancel and Nave from Altar ...	August 26, 1904
General Exterior (North Side) ...	September 9, 1904
Interior of Central Tower ...	September 23, 1904
North Side of Choir	October 7, 1904
South Aisle from West End ...	October 28, 1904
General Interior, Nave, and Chancel from West End ...	November 11, 1904
Nave from Chancel	November 25, 1904
South Aisle from East End ...	December 2, 1904
Chancel from Nave	December 9, 1904
North Side of Choir	December 16, 1904

ST. ASAPH.

General Exterior from South-West Corner looking North-East	January 6, 1905
The West Door	January 20, 1905
Interior from West End	February 3, 1905
General Interior from East End	February 17, 1905
Chancel from Nave	March 3, 1905
General Exterior, North Side ...	March 17, 1905
South Aisle from West End looking North-East	March 31, 1905
Nave from Chancel	May 5, 1905
The Altar	June 2, 1905
View across Nave looking South-East	June 23, 1905
The Choir, North Side. Interior of Chapter-House	June 30, 1905

WAKEFIELD.

Chancel and Nave from East End	July 7, 1905
Recent Extension at East End ...	July 21, 1905
Detail of Screen	August 4, 1905
Chancel Arch and Screen... ...	August 18, 1905
The South Choir	September 1, 1905
One of Two Carved Wood Screens, with Doors to the New St. Mark's Chapel... ...	September 15, 1905
North Choir and N w Part of Organ	September 22, 1905
Groined Ceiling, St. Mark's Chapel (Modern)	September 29, 1905
St. Mark's Chapel, West End (recent addition)...	October 6, 1905
Nave and Chancel from West End	October 20, 1905
View from South-East Corner of South Aisle, looking North-West	November 3, 1905

WAKEFIELD—*continued.*

View from North Transept across Sanctuary to South Transept ...	November 10, 1905
Altar and Reredos	November 17, 1905
Part of South Transept	November 24, 1905
St. Mark's Chapel	December 1, 1905
General Exterior	December 8, 1905
The Chancel	December 15, 1905
General Interior, looking East ...	December 22, 1905
Effigy of the late Bishop How ...	December 29, 1905

TRURO.

View of the North Side	January 5, 1906
View of East End from the Bridge	January 19, 1906
The North Side, showing Central Tower and Spire...	February 2, 1906
View from North-West	February 9, 1906
South Choir Aisle	February 16, 1906
Baptistery from the South-West	February 23, 1906
Interior of Baptistery and Font ...	March 9, 1906
View of North Transept	March 23, 1906
West Front, South Porch ...	April 6, 1906
Bishop's Throne and South Side of Choir and Nave	April 20, 1906
East End showing Reredos ...	May 11, 1906
The Sanctuary, High Altar, Reredos and Sedilia	May 18, 1906
Nave and West End with Gallery	June 1, 1906
The Nave, looking West	June 22, 1906
Full Length View, looking East...	June 29, 1906

ST. DAVIDS.

View from South-East	July 6, 1906
West Front and part of ruined College of St. Mary. Exterior of Lady Chapel	July 13, 1906
View of Nave from West Door ...	July 20, 1906
The Choir and Parclose Screen from North-East. The Lady Chapel	August 3, 1906
The Triforium and Clerestory from top of Rood Screen. The Rood Screen	August 10, 1906
From South-West (showing South Porch and South Transept). Exterior from South-East ...	August 17, 1906
The Nave, looking West	August 24, 1906
The Choir, Eastwards	August 31, 1906
Showing North Door. The Choir, Westwards	October 5, 1906
The Choir, Westwards from High Altar	October 12, 1906
View across Nave from South Door. South Choir Aisle from South Transept	October 19, 1906

MANCHESTER.

From South-East	October 26, 1906
New Chapter-House from South-East	November 2, 1906
View across Nave from South-East, showing Double Nave Aisle	November 9, 1906
South-East Corner, showing Old Chapter-House	November 16, 1906
The South Porch and Tower ...	November 23, 1906
Old Chapter-House Door in South Choir Aisle	November 30, 1906
The Choir, Eastwards	December 7, 1906
The Nave, Eastwards	December 14, 1906
The Choir, Westwards	December 21, 1906

CARLISLE.

Exterior from South-West ...	January 11, 1907
Remains of Norman Nave ...	January 18, 1907
Tower and South Transept ...	January 25, 1907
The East Window	February 15, 1907
View of Choir looking East ...	February 22, 1907
South Aisle looking East	March 8, 1907
Exterior of Choir from South-West	March 15, 1907
Exterior from South-East... ...	March 22, 1907
South Transept Door	April 12, 1907
The Choir, Triforium, and Clerestory (South Side)	April 26, 1907
South Aisle looking West... ...	May 17, 1907
View from South Transept showing Norman Arch	May 31, 1907

CARLISLE—*continued.*

View of Choir looking West ...	June 14, 1907
The Choir from Organ Loft (the East End)	June 21, 1907
View across Transepts from South	June 28, 1907

SOUTHWARK.

View of Exterior	July 5, 1907
View of Chancel	July 19, 1907
The New Harvard Chapel. The Gower Monument	August 2, 1907
The Lady Chapel	August 16, 1907
North Side of Chancel, showing Triforium	September 6, 1907
North Transept	September 20, 1907
The Nave from the Chancel ...	October 4, 1907
The Nave, looking East	October 18, 1907
North Aisle	November 15, 1907
North Choir Ambulatory	November 29, 1907
Nave, looking West	December 6, 1907
North Transept from South ...	December 13, 1907
Fox's Screen	December 20, 07

OXFORD.

The Cloisters and Cathedral ...	January 3, 1908
View from the Garden	January 17, 1908
The Latin Chapel	February 7, 1908
South Transept and Lady Chapel	March 6, 1908
North Aisle	March 20, 1908
The Nave	April 3, 1908
Norman Arch and Cloisters ...	April 10, 1908
The Choir	April 17, 1908
Interior, looking East	April 24, 1908

NEWCASTLE.

View from Castle Ramparts ...	May 1, 1908
Bishop's Throne, and one Bay of Choir Stalls	May 8, 1908
Screen and Sedilia...	May 15, 1908
Choir Screen from West	May 22, 1908
Full-Length View Eastwards ...	May 29, 1908
The Nave, Westwards	June 5, 1908
Organ in North Transept... ...	June 12, 1908
Font and Tower Arch on South Side...	June 19, 1908
Full-Length View Westwards ..	June 26, 1908

SOUTHWELL.

Ground Plan	September 9, 1898
View from North-West	September 9, 1898
Choir (West)	September 16, 1898
Choir (East)	September 23, 1898
Carvings, &c.	September 30, 1898
View from South-East	October 7, 1898
Distant View	October 14, 1898
Details of Right-hand side of Chapter-House Door	July 10, 1908
The Chapter-House Door	July 24, 1908
The Sedilia	July 31, 1908
The Rood Screen, East Side ...	July 31, 1908
The Chapter House, West Side ...	August 7, 1908
The South Nave Aisle	August 21, 1908
The Nave, looking Eastwards ...	August 28, 1908
North Door and part of Norman Arcading in North Porch ...	September 11, 1908
View across Transepts, looking Southward	September 25, 1908
West Front	October 9, 1908

BIRMINGHAM.

From South-West	October 16, 1908
View Eastwards	October 23, 1908
View Westwards	October 30, 1908
The Choir, Eastwards	November 13, 1908
Altar and East Window	November 20, 1908
The Baptistery	November 20, 1908

LLANDAFF.

East End of Lady Chapel... ...	January 7, 1910
West Front	January 14, 1910
Western Towers and Spire ...	January 21, 1910
Interior, looking Eastwards ...	January 28, 1910
From the South-East	February 4, 1910
The Choir, Eastwards	February 11, 1910
South Nave Aisle, from East ...	February 18, 1910
North Side of Choir, Interior ...	February 25, 1910
North Side of Nave	March 11, 1910
The Sanctuary	March 18, 1910
South Door	March 25, 1910
West Door	March 25, 1910

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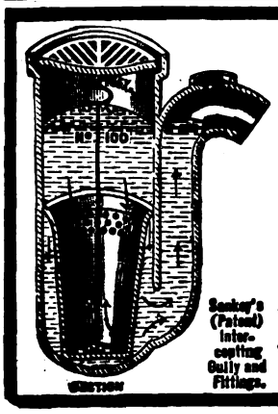
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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

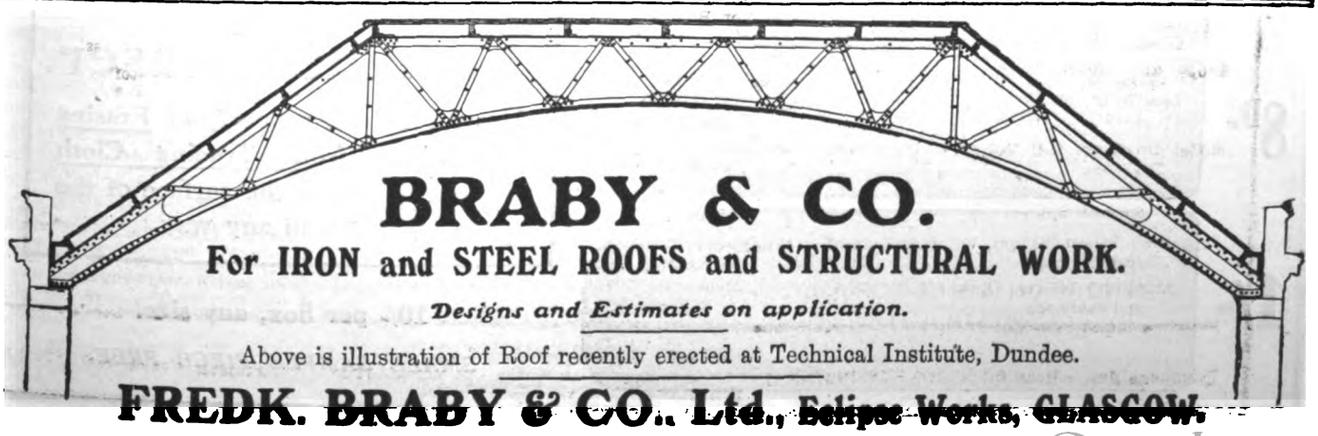
ANTWERP.—Oct. 1.—An international competition is being arranged for a scheme for the laying out of the land surrounding Antwerp, which will shortly be available by the demolition of the encircling fortifications. Premiums of 1,000*l.*, 400*l.*, and 200*l.* are offered. Copies of the conditions, &c., may be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C., or, on payment of 100 francs from the "Commission d'études de l'aménagement de l'agglomération anversoise," 57 Rue du Jardin des Arbalétriers, Antwerp.

BOURNEMOUTH.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

BRIGHTON.—Oct. 1.—The Governors of the Brighton, Hove and Sussex Grammar School invite architects experienced in scholastic buildings to submit their names for a proposed limited competition. The Governors intend to erect new buildings at a cost of about 16,000*l.* Send names and particulars of buildings by Oct. 1 to Mr. A. F. Graves, clerk to the Governors, 9 North Street Quadrant, Brighton. (For further details see advertisement Sept. 16.)

IRELAND.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

IRELAND.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook,



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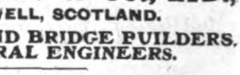
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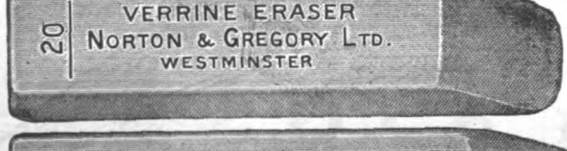
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Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

MANCHESTER.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

RUISLIP.—Nov. 15.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

WALES.—Oct. 1.—The Town Council of the borough of Denbigh invite competitive plans and designs of a public hall, markets, municipal buildings, &c., which it is proposed to erect at a cost not to exceed 10,000*l.* Three premiums are offered, viz. 75*l.*, 30*l.* and 20*l.*, as first, second and third respectively. Send 1*l.* 1*s.* deposit for particulars, &c., Mr. J. Parry Jones, town clerk, Denbigh.

CONTRACTS OPEN.

BENSHAM.—Oct. 4.—For a small alteration at the Workhouse for the Gateshead Union. Messrs. Newcombe & Newcombe, architects, Pilgrim Street, Newcastle-on-Tyne.

BISHOP'S STORTFORD.—Oct. 3.—For alterations and additions to the laundry at the workhouse. Mr. Alfred G. Gwynn, clerk, 29 North Street, Bishop's Stortford.

BLACKBURN.—Oct. 3.—For the erection of a new police station, sessions court, &c., on Blakey Moor (superstructure section). Send 1*l.* 1*s.* at once. Messrs. Briggs, Wolstenholme & Thornley, and Stones & Stones & Atkinson, Richmond Terrace, Blackburn.

BRAMPTON.—For the various works required in erection of a house at Howgate, Brampton, near Carlisle. Send names to Messrs. Nelson & Brindle, architects, &c., 22 Lowther Street, Whitehaven.

CHESTER.—Oct. 11.—For erection of a secondary school for boys and girls in Queen's Park. Deposit 1*l.* Mr. W. T. Lockwood, F.R.I.B.A., 88 Foregate Street, Chester.

CHESTER.—Oct. 17.—For a new annexe for 440 patients at the Upton Asylum. Deposit 3*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

COVENTRY.—Oct. 1.—For the work and materials in connection with the repairs and renovations to the exterior of the Central Free Library building. Send 1*l.* 1*s.* deposit to the City Treasurer, Mr. J. E. Swindlehurst, city engineer and surveyor, St. Mary's Hall, Coventry.

DARTMOUTH.—Oct. 1.—For providing and fixing a quantity of wrought-iron railing at the Longcross Reservoir. Mr. Thos. W. Joyce, A.M.I.M.E., F.G.S., borough engineer and surveyor.

DARTON.—Oct. 5.—For the joiner, builder and plumber trades required in general repair of Darton Council infants' school, Barnsley, Yorks. Mr. T. Graham, W.R. Education Offices, Obelisk Chambers, Barnsley.

DEPTFORD.—Oct. 18.—For (1) construction of flooring over first-class swimming-bath at Laurie Grove, New Cross; (2) alterations to building. Deposit 1*l.* 1*s.* Mr. J. Sutcliffe, A.M.Inst.C.E., borough surveyor, Town Hall, New Cross Road, S.E.

DOUGLAS.—Oct. 1.—For new mission hall and Sunday school at St. Matthew's, Douglas, Isle of Man. The Rev. H. S. Taggart, M.A., St. Matthew's Vicarage, 2 Mount Havelock.

DOVERCOURT.—Oct. 7.—For the taking down of the brick boundary wall of the All Saints' Parish churchyard, abutting on the main road, and rebuilding the same. Mr. G. D. Hugh-Jones, Dovercourt, Essex.

EASINGWOLD.—Oct. 1.—For the erection of the proposed Secondary school for the North Riding of Yorkshire County Council education committee. Send names by Oct. 1 to Mr. J. C. Wrigley, secretary, Education Offices, County Hall, Northallerton.

EAST TWERTON.—Oct. 3.—For additions and alterations to the Council Schools, East Twerton, Bath. The head master of the school, or of Mr. W. F. Bird, M.S.A., Midsomer Norton.

IRELAND.—Oct. 4.—For building and completing the technical school, on a site between Victoria Street and back road, Larne. Deposit 1*l.* 1*s.* Messrs. Hobart & Heron, architects, 120 Scottish Provident Buildings, Donegall Square West, Belfast, or the Town Clerk's Office, Larne.

IRELAND.—Oct. 5.—For roofing over coal yard and building a wall at rear of workhouse infirmary for the Guardians of Larne Union. Mr. S. M. Wallace, clerk, Union Office, Larne.

IRELAND.—Oct. 8.—For erection of a boiler-house at the workhouse infirmary, Londonderry. Messrs. Robinson & Davidson, C.E., A.R.I.B.A., Londonderry.

LAMBOURN.—Oct. 15.—For building a Council school at Lambourn, Berks, for 100 children. Send names and 2*l.* 2*s.* deposit by October 1 to the Secretary to the Education Committee, Market Place, Reading, Berks.

LEEDS.—Oct. 8.—For the whole or any portion of the work required in connection with additions and alterations to the Divisional Police Station, Millgarth Street. Deposit 1*l.* 1*s.* Mr. Archibald Neill, F.R.I.B.A., 38 Park Row.

LIVERPOOL.—Oct. 5.—For erection of a drill hall and fencing in Rathbone Road, for the West Lancashire Association. Mr. J. P. Fraser, architect, 14 Elliot Street, Liverpool.

LONDON.—Oct. 13.—For certain works of external repairs and painting at the North Infirmary of the parish, Dartmouth Park Hill, N. Mr. J. E. P. Hall, clerk, Town Hall, Pancras Road, N.W.

LONDON.—Oct. 5.—For supply and erection of an aviary and wrought-iron enclosure at Clissold Park, Stoke Newington, N., for the London County Council. The Parks Department, 11 Regent Street, S.W.

MAIDSTONE.—Oct. 12.—For erection of a cart shed and scratching shed on the Asylum farm, also glass roof over iron staircase adjoining buildings. The Engineer, Kent County Asylum, Maidstone.

MARGATE.—Oct. 17.—For erection of a dust destructor. Mr. E. A. Borg, borough surveyor, 13 Grosvenor Place, Margate.

ROTHERHAM.—Oct. 4.—For erection of a balcony, &c., at the swimming baths, Market Street. Mr. Ernest B. Martin, A.M.I.C.E., borough engineer, Town Hall, Rotherham.

MULLION.—Oct. 8.—For erection of a cattle and root house at Newton, in the parish of Mullion, Cornwall. Mr. George Gow, Tregothnan Office, Truro.

NOTTINGHAM.—For the laying-out of certain airing courts at the workhouse and for the erection of a shelter, for the Guardians. Mr. Arthur Marshall, King Street, Nottingham, architect.

PETERTAVY.—Oct. 7.—For erection of a detached dwelling house at Petertavy, Tavistock. Mr. T. H. Harris, 1 Millbrook Place, Tavistock.

PONTEFRACT.—Oct. 5.—For the whole or any portion of the following works in Pontefract: (1) Conversion of Richmond House, Horsefair, into three dwelling-houses, and the erection of two other houses adjoining; (2) for erection of fifteen dwelling-houses in Northgate. Forward names by October 5 to Messrs. Garside & Pennington, architects and surveyors, Ropergate, Pontefract, and Central Chambers, Castleford.

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REIGATE.—Oct. 15.—For supplying and erecting complete a disinfector at the new disinfecting station at the sewage disposal works, Earlswood. Mr. Fred. T. Clayton, C.E., borough engineer, Municipal Buildings, Reigate.

ROMFORD.—Oct. 3.—For carrying out alterations and repairs at the public baths, Mawneys Road. Mr. J. Turvey, surveyor, Council Offices, Romford.

ROTHERHAM.—Oct. 7.—For the work required in erection of offices and dwelling-house, in Wellgate and Gerard Road, for the Amalgamated Union of Enginemen and Firemen, &c. Messrs. Edward Hutchinson & Sons, architects and surveyors, 18 Howard Street, Rotherham.

SALFORD.—Oct. 10.—For supplying and fixing an emergency iron staircase at the Trafford Road boys' school. The Director of Education, Education Office, Chapel Street, Salford.

SCOTLAND.—Oct. 8.—For the mason, joiner, slater, plumber, plaster, glazier, and painter works required in the erection of a police station at Bridge of Earn. Messrs. Smart & Stewart, architects, 42 Tay Street, Perth.

SEAFORD (SUSSEX).—Oct. 5.—For the supply and erection—subject to the sanction of the Local Government Board being obtained for the loans—of a two-cell destructor and boiler, in a building to be constructed by the Council at their sewage pumping station. Deposit 2*l.* 2*s.* The Offices of the Council, or Messrs. Pollard & Tingle, engineers, 31 Old Queen Street, Westminster, S.W.

SLOUGH.—Oct. 5.—For erection of a secondary school (to accommodate about 120 children) at Slough, Bucks. Apply by October 5 to Mr. C. G. Watkins, secretary, Education Office, Aylesbury.

SOUTHALL.—Oct. 4.—For the following, for the Southall Norwood Urban District Council, viz.:—(*a*) Boiler house; (*b*) hot-water heating; (*c*) hot-water supply at the sanatorium; and (*d*) paving works; and (*e*) channelling work. Mr. Reginald Brown, A.M.I.C.E., F.S.I., &c., engineer and surveyor, Public Offices, Southall, Middlesex.

SOUTHAMPTON.—Oct. 6.—For the enlargement of the pavilion, Royal Pier, for the Southampton Harbour Board. Deposit 1*l.* 1*s.* Mr. E. Cooper Poole, A.M.I.C.E., engineer and surveyor to the Board, Harbour Offices, Town Quay, Southampton.

STANWAY.—Oct. 6.—For erection of a new school at Stanway, Essex, for 260 children, for the Lexden and Winstree district sub-committee. Send names and 3*l.* 3*s.* deposit by Oct. 6 to Mr. J. W. Start, F.S.I., architect, High Street, Colchester.

SWARBY (LINCS.).—Oct. 3.—For erection of a Primitive Methodist chapel, at Swarby. Mr. G. W. Cooper, architect and surveyor, Sleaford.

SYDENHAM.—Oct. 4.—For building a boundary wall at the Home Park Depot, Lower Sydenham, for the Lewisham Borough Council. Surveyor's Department, Town Hall, Catford.

THORNE MOORENDS.—Sept. 30.—The West Riding Education committee invite whole or separate tenders for the following works, in connection with alterations and additions to Thorne Moorends Council school, viz.:—Builder, joiner, slater, plumber, plasterer, painter. The Education Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

TOTTENHAM.—Oct. 3.—For the following works at Crowland Road School, for the Tottenham Education Committee:—Tar-paving, wood-block floors, roller window-blinds, stoves and ranges, hot-water heating apparatus. Send names and 1*l.* 1*s.* deposit by October 3. Mr. G. E. T. Laurence, A.R.I.B.A., 22 Buckingham Street, Adelphi, W.C.

WAKEFIELD.—Oct. 21.—The West Riding Education Committee invite whole or separate tenders for the following works:—Wales Council school, alteration and additions (builder, joiner, slater, plumber, plasterer, painter, heating engineer). Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield. The Education Architect, Wakefield.

WALES.—Oct. 1.—For erection of a hall at Church Village, near Pontypridd, for the Efail Isha Congregational Church. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and engineers, Pontypridd.

WALES.—Oct. 1.—For erection of fifteen houses at Pontyclun, for the Pontyclun Building Club. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and engineers, Pontypridd.

WALES.—Oct. 1.—For building a school (accommodation 500) at Hendy, Pontardulais, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., County Architect, County Education Offices, Carmarthen.

WALES.—Oct. 1.—For erection of a fire station at Hengoed for the Gellygaer Urban District Council. Mr. James P. Jones, surveyor, Council Offices, Hengoed.

WALES.—Oct. 1.—For alterations and additions to the Swansea Hospital. Apply by letter to Mr. W. D. Hughes, secretary.

WALES.—Oct. 3.—For erection of a caretaker's house in Howell Street, Swansea, and adjoining the Dyfatty School. The Borough Estate Agent, 3 Prospect Place, Swansea.

WALES.—Oct. 4.—For erection of branch premises at Talywain, Mon., for Messrs. the Abersychan, British and Talywain Industrial Co-operative Society, Ltd. Mr. A. Gordon Babbidge, architect and surveyor, Clarence Chambers, Pontypool.

WALES.—Oct. 12.—For the erection at Swansea of the following works, for the Glamorgan County Territorial Force Association: Headquarters block, for six units, with officers' mess; riding school, 150 feet by 53 feet 6 inches, with stable, magazine, and yard adjoining; drill-hall, 150 feet by 80 feet, with caretaker's cottage, lavatories, and miniature rifle range adjoining; re-erection of existing gateway in altered position, new entrance from Richardson Street; also latrines and sundry works to existing sheds. Deposit 3*l.* 3*s.* Mr. C. H. Rogers, architect, 10 Quay Parade, Swansea.

WALES.—Oct. 7.—For erection of cottages, farm buildings, &c., at and near Barry, Glamorgan, as follows: (1) At Cwmcidy, two cottages, one bakehouse, and two sets of farm buildings, an accommodation road; (2) Beggarswell Road, four cottages, one bakehouse, and four sets of farm buildings, an accommodation road; (3) Port Road, four cottages, one bakehouse, and four sets of farm buildings, for the Glamorgan County Council. The Barry Dock Police Station, or at the Glamorgan County Council Offices, Westgate Street, Cardiff.

WINCHMORE.—Oct. 28.—For erection of an infants' school at Winchcombe, Gloucestershire. Deposit 2*l.* 2*s.* Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

WHITCHURCH.—Oct. 14.—For erection of a secondary school at Whitchurch, Salop, to accommodate 140 pupils, for the Salop Education Committee. Send 2*l.* 2*s.* deposit to Mr. J. Holt, architect, 9 Albert Square, Manchester.

WHIXALL.—Oct. 7.—For erection of a cottage and farm buildings for small holdings at Braynes Hall Farm, Whixall. Salop, about two and a half miles from Prees Station. Mr. Wm. T. Hall, College Hill, Shrewsbury.

TENDERS.

BROMLEY.

For the new schools to be erected at Mason's Hill.

Pearce	£5.966	0	0
Crossley	5.875	0	0
Ellingham	5.869	0	0
Arnaud	5.857	0	0
Perry Bros.	5,857	0	0
Willet	5.727	0	0
Blay	5.543	0	0
Duthoit	5,442	0	0
Cook, Crawley (*accepted*)	5,365	0	0

DARTFORD.

For the sewering of Courtney Avenue, Wilmington.

Pedbritt	£980	0	0
Foster	969	0	0
Lane	919	0	0
Ellingham	889	0	0
Catley	880	0	0
Rayner	832	0	0
Wood & Sons	814	0	0
Pryce	795	0	0
Blay	785	0	0
Lonsdale (*accepted*)	695	0	0

GREENFORD.

For erection of residence at Perivale, Greenford, Middlesex. Mr. A. T. L. Weatherhead, architect, Ealing.

Lowe & Co.	£1,600	0	0
Mallett	1,400	0	0
Groom, Ealing (*accepted*)	1,233	15	0
Architect's estimate	1,325	10	0

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EASTBOURNE.

For erection of a pair of cottages in Green Street, Old Town. Mr. F. G. COOKE, A.M.I.C.E., architect, Eastbourne.

Bodle	£1,050 0 0
Hookham	984 0 0
Martin	925 0 0
Thompson	877 0 0
Avard	860 0 0
Marchant	846 0 0
NEWMAN, Eastbourne (*accepted*)	825 0 0
Architect's estimate	825 0 0

GLOUCESTER.

For additions to Sir Thomas Rich's school. Mr. WALTER B. WOOD, architect, Gloucester.

Sapcote & Sons	£2,693 0 0
King & Sons	2,567 0 0
J. & M. Patrick	2,518 0 0
Blake	2,415 0 0
Peer	2,284 18 6
Crane	2,270 15 0
Stephens & Bastow	2,266 0 0
Dolman	2,254 0 0
Tilston	2,239 0 0
Jones	2,184 0 0
Bowers & Co.	2,140 15 0
Walters & Son	2,124 0 0
Corah & Son	2,079 8 0
Byard & Sons	2,050 0 0
NICHOLLS, Gloucester (*accepted*)	2,022 10 0

HEREFORD.

For erection of two residences in Hafod Road. Mr. ERNEST DAVIES, M.S.A., architect, Hereford and Monmouth.

Preece	£2,231 17 6
Wilks & Son	2,184 0 0
Cooke	2,178 0 0
Powell & Son	2,136 7 0
BOLT, Hereford (*accepted*)	1,990 0 0

IRELAND.

For carrying out a sewerage and sewage purification scheme for the district of Cregagh, for the Castlereagh Rural District Council.

Geddis	£4,917 0 0
Workman	4,770 0 0
R. & I. Pierce	4,160 17 4
Irish Armoured Tubular Flooring Co.	4,033 5 10
Courtenay & Co.	3,896 0 0
Graham	3,860 0 0
J. & R. Thompson	3,598 0 0
Hogg & Sons	3,595 0 0
H. & J. Martin	3,517 9 1
Pollock	3,191 0 0
GRAINGER BROS., Holywood, Co. Down (*accepted*)	3,186 18 2

For extending Cultra sewage purification works, with outfall, &c., for the Castlereagh Rural District Council.

Geddis	£1,606 17 7
Graham	1,600 0 0
H. & J. Martin	1,560 4 8
Courtenay & Son	1,410 0 0
Boyd	1,330 0 0
J. & R. Thompson	1,285 0 0
Millar	1,274 0 0
Grainger Bros.	1,244 1 6
POLLOCK, Bangor, Co. Down (*accepted*)	1,075 0 0

LONDON.

For works at Titchfield and Minehead, Ouseley Road, Balham, for the Wandsworth Guardians.

Milan	£450 0 0
Carney & Sons	382 0 0
Farmer & Sons	377 10 0
Singleton	375 0 0
Ronald	365 0 0
Sharpington & Co.	359 0 0
Samways	335 0 0
Curd Bros. & Co.	330 0 0
Nightingale	323 0 0
Collins	310 0 0
WOOLLASTON BROS., 22 Rockmead Road (*accepted*)	300 10 6

LONDON—*continued.*

For painting and other works to the interior and exterior of the Islington Infirmary, Highgate Hill, for the Guardians of the Poor of St. Mary, Islington. Mr. EDMUND J. HARRISON, architect, 9 Gray's Inn Square.

	Internal work.	External work.
Campbell & Christmas	£465 0 0	£1,200 0 0
Richards & Son	357 0 0	1,185 0 0
Mackinley	550 0 0	1,181 10 0
Hudgell	412 18 0	1,150 0 0
Reason	399 0 0	1,050 0 0
Brown & Son	663 7 6	1,040 11 0
Wollaston & Co.	339 0 0	960 0 0
Whitby Bros.	346 0 0	943 0 0
Cheetham	334 0 0	830 0 0
Ferguson & Co.	363 12 0	828 6 0
Dearing & Co.	401 0 0	799 0 0
Stokes & Sons	336 8 4	789 15 0
Johnson	340 0 0	786 0 0
Woollaston Bros.	270 0 0	750 0 0
Sage & Co.	330 0 0	720 0 0
Scott-Fenn	299 0 0	699 0 0
Dainton	344 10 0	693 0 0
Nightingale	278 0 0	640 0 0
Robbins	613 0 0	610 0 0
JEWELL, Finsbury Park (*accepted*)	275 0 0	565 0 0

For alterations and additions to the Cavendish and British Hotels, Jermyn Street. Messrs. CHESTON & PERKIN, architects, 5 Union Court, Old Broad Street.

Lawrence & Sons	£10.569 0 0
Killby & Gayford	10.559 0 0
Williams	10.489 0 0
Hall, Bedall & Co.	10,265 0 0
Munday & Sons	9,995 0 0
Higgs & Hill	9,990 0 0
Carmichael	9,976 0 0
Minter	9,948 0 0
Johnson & Co.	9,835 0 0
Falkner & Sons	9,483 0 0
F. & H. F. Higgs	9,460 0 0
MADDISON, Canning Town (*accepted*)	9,355 0 0

For erection of stables at the Urban District Council's River Depot. Mr. E. WILLIS, A.M.I.C.E., engineer, Chiswick.

Abbott & Charlton	£2,590 0 0
Freeman	2,388 8 4
Pedrette	2,091 14 10
Blackburn	2,040 0 0
Weibking	1,995 0 0
Muirhead & Co.	1,989 0 0
Millman	1,975 0 0
Dainton	1,948 0 0
Neal	1,917 0 0
Collins	1,908 0 0
Clarke	1,889 0 0
Nightingale	1,855 0 0
Higgs & Randall	1,844 14 4
Eyles	1,827 0 0
Hampton	1,757 0 0

WALES.

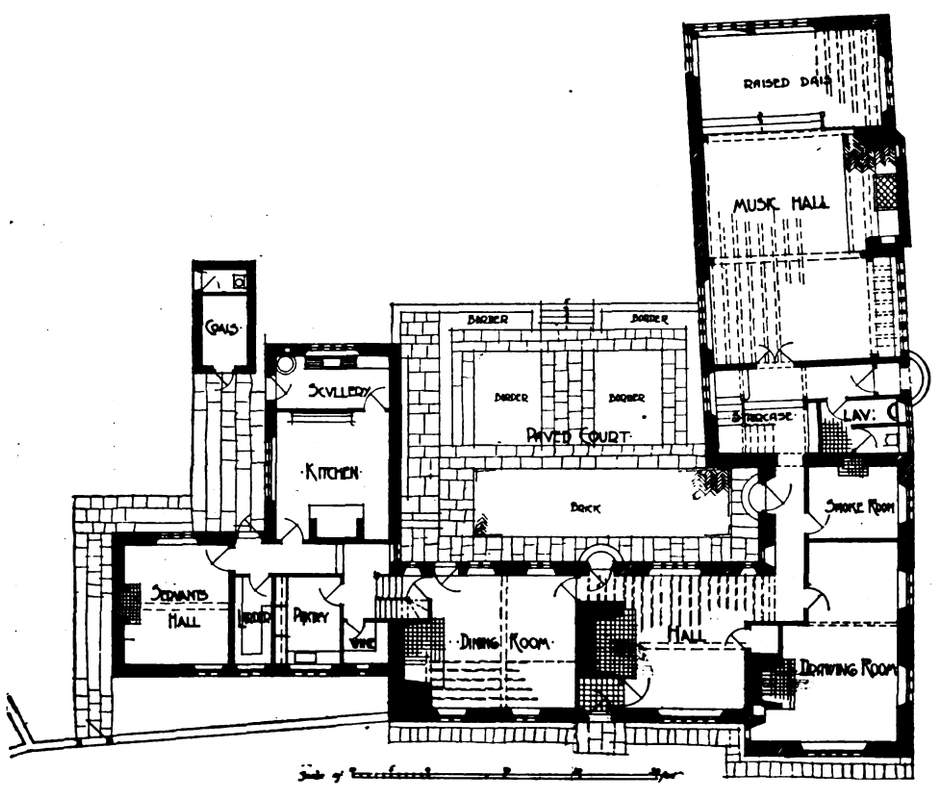
For erection of a training college for women at Glanmor, Swansea, for the education committee.

Jenkins	£51,775 0 0
Dawson & Jones	50,941 10 0
Moon	50,727 14 0
W. & J. R. Watson	50,199 12 4
Davies	47,499 11 4
Thomas & Sons	47,130 10 9
Pethick Bros.	46,064 0 0
Lowe & Sons	46,000 0 0
Knox & Wells	45,578 0 0
Billings & Sons	45,513 18 0
Stephens, Bastow & Co.	43,997 0 0
Davies & Sons	43,800 0 0
Bowen & Sons	42,897 0 0
Williams	42,247 0 0
Willcocks & Co.	41,785 0 0
Bowers & Co.	40,400 0 0
J. & D. Jones	39,750 0 0
Spencer, Santo & Co.	39,675 0 0
Bennett Bros.	39,540 0 0
Colborne	38,110 0 0
Blake	38,000 0 0
J. & F. Weaver	38,000 0 0
LLOYD BROS., Swansea (*accepted*)	37,317 19 11
Turford & Southward	37,169 0 0
Parkinson & Hodgens	35,041 11 6

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COTTAGE AT WENDOVER, BUCKS.—Mr. MAURICE H. POCOCK, Architect. [From *The English Home.*



[From *The English Home.*

ORCHARD FARM, BROADWAY, WORCESTERSHIRE.—Mr. A. N. PRENTICE, F.R.I.B.A., Architect.

THE BRITISH FIRE PREVENTION COMMITTEE.

The work of the British Fire Prevention Committee for the impending session, which commences in October, will include, besides its usual fire tests, the preparation of some important summaries in tabular form, giving the classified results of its investigations during the past ten years (1901-10). This work, which will be of a very comprehensive character, will, it is anticipated, be of considerable value to all who have to deal with the question of fire protection.

The tests of the past summer session, which have been completed and reported upon, include among other subjects records of tests with ordinary proprietary roofing materials, with treated and untreated flannelette, flannel, and similar textiles, with several forms of fire-resisting doors, and different types of fire-extinguishers. Seven reports of tests have already been issued this year, and two more will be issued shortly.

During the past session a record has also been issued as to the findings of a Special Commission of the British Fire Prevention Committee during a visit of investigation of fire matters in Northern Germany.

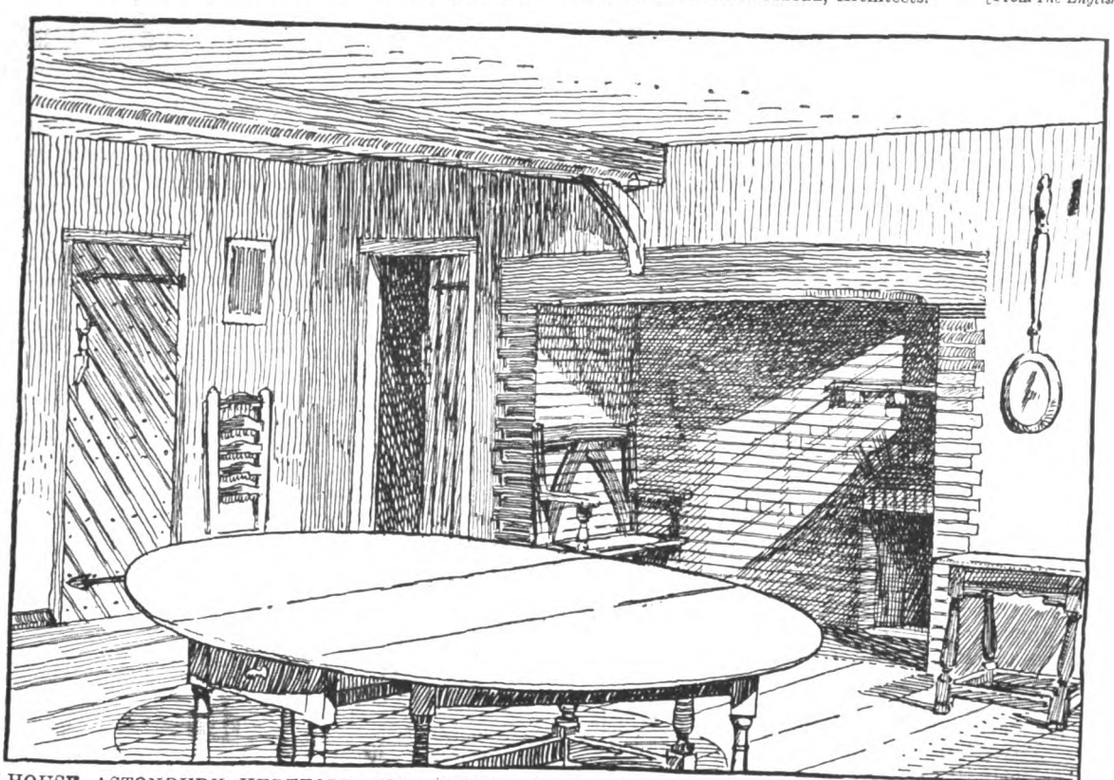
Evidence has further been presented on behalf of the committee at the Government inquiries on the question of fire inquests, on the danger of flannelette, and on the storage of petrol.

Arrangements are being made to extend the usefulness of the committee's "inquiry office," and a special fire library, dealing with the fire literature of Europe and the United States, has been formed. A catalogue of this library (which already counts some 2,500 volumes) will be published next year.

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NEW FARM-HOUSE, ASTONBURY, HERTFORDSHIRE.—Messrs. FORSYTH & MAULE, Architects. [From *The English Home.*



NEW FARM-HOUSE, ASTONBURY, HERTFORDSHIRE, SITTING-ROOM.—Messrs. FORSYTH & MAULE, Architects. [From *The English Home.*



SEMI-DETACHED HOUSES AT HAMPSTEAD GARDEN SUBURB.—Mr. M. H. BAILLIE-SCOTT, Architect. [From *The English Home.*

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SANITATION IN DEVONSHIRE.

DR. G. ADKINS, county medical officer of health for Devon, has issued his annual report for 1909, together with a summary of the annual reports of the medical officers of health for the different districts in the county. Having inspected all the urban districts, Dr. Adkins states that in the course of his visits he was at times pleased to find the up-to-date sanitary conditions of many of the areas, especially in regard to water supply and drainage. There were very few districts in which improvement was required in these directions.

With the progress of sanitary knowledge, drainage and water supply were gradually passing outside the domain of the medical officer of health, and were being dealt with by engineers who were experts on this subject. This relief should now give the medical officers of health more time to concentrate their attention on the individual with regard to infectious diseases.

The report covers a wide range, and, amongst other things, contains interesting allusions to such problems as house accommodation, drainage conditions, and water supply. In reference to the first, it is found that in the rural areas only seven medical officers of health reported the house accommodation as adequate for their district. At Holsworthy, where the accommodation was quite inadequate, cases had been reported under the Working Class Act, 1890. Building by-laws were now in force in the Kingsbridge district. At Okehampton there had been an all-round improvement in the houses of the working classes. Active measures were being adopted to improve cottages in the Torrington district. In the urban areas an inadequacy of house accommodation was reported in twenty of the thirty-two districts. The provision of suitable dwellings for the artisan and poor classes was a matter of increasing seriousness in Honiton.

During the year many improvements in water supply had been carried out in different parts of the county. Most of the urban districts now possess a satisfactory water supply. That in the rural areas was in no degree as satisfactory as in the urban districts, especially in the northern districts, where in many villages no public supply was in existence, the inhabitants having to obtain their water from private surface wells. Many of those were open dipping wells, or so situated that their water must at times be polluted, thus causing a state of ill-health, and rendering the drinkers, therefore, more vulnerable to infectious diseases. No sanitary authority should be content with that condition of affairs, but should consider it to be an imperative duty to introduce a sufficient and wholesome supply. In order to show where attention in the matter of improving water supplies in the different districts was necessary, the following list had been drawn up: Axminster, Hawkchurch scheme not carried out; Dartmouth, purchase of watershed to prevent pollution by farms and inhabited houses; Kingsbridge (rural), better distribution required for Aveton Gifford, Kingston, and Stokefleming; Newton Abbot (rural), new supply for Islington; Plympton St. Mary, new supply for Newton Ferrers and Ermington; Totnes (rural), new supply for Ugborough, Stoke Gabriel, Marldon, and Holne; Southmolton (urban), better filtration and covering in of reservoir required; Holsworthy (rural), deficient supply at Black Torrington. All with the exception of Ermington and Holne had been previously reported on.

Improvements and new work in connection with drainage conditions were reported from nearly every district, but it was reported that the crude out-of-date system at Holsworthy remained in an unsatisfactory condition. New rows of houses were within 150 feet of the main outfall, and more houses were to be built nearer than these to the outfall. It was reported that new sewers had been laid in different parts of Northam, but the outfalls at Northam, Appledore, and Westward Ho! still remained unsatisfactory. The following was a list of the districts where an unsatisfactory condition of drainage existed: Axminster, new system for the town and for Colyton; Barnstaple, new drainage scheme for Georgeham; Culmstock, new sewer required for Milemore; Holsworthy (rural), new scheme for Halwell; Holsworthy (urban), new outfalls required; Honiton (urban), new outfall works required; Honiton (rural), extension of sewer at Plymptree required; Kingsbridge, Newton Abbot (rural), Northam, Okehampton (rural), Plympton St. Mary, and Tavistock (rural).

MR. T. MAYOR, of 4 Mauldeth Road, West Withington, Manchester, and of 41 John Dalton Street, Manchester, architect and surveyor, has left estate valued at 21,634*l*.

KENSINGTON ROAD IMPROVED LIGHTING.

THE magnificent improvement that has just been completed by the City of Westminster in the lighting of that important thoroughfare, Kensington Road, and of all the streets in the neighbourhood, is being generally commented upon by the residents of that district on their return to town. The road from Knightsbridge Barracks to Queen's Gate is now so beautifully and evenly lighted, with an entire absence of glare, that it may well be described as one of the best-lit streets in the world. This alteration—greatly appreciated by 'bus and cab drivers and by the police, as well as by the inhabitants—forms part of the general scheme for the improved lighting of Westminster which was adopted by the City Council last April. The lighting is being done by inverted incandescent gas burners, the tender of the electric light companies having been 60 per cent. higher than that of the Gas Light and Coke Company, who are carrying out the work.

In this connection it may be mentioned that the Highways Committee of the Stoke Newington Borough Council have accepted the offer of the Gas Light and Coke Company to instal, at the company's expense, inverted incandescent burners in place of the present upright ones, and to light and maintain the same at prices which will effect a saving in the cost of street lighting of 250*l*. per annum, whilst the candle-power of the lamps will be increased by 20 per cent.

A SOLUBILITY TEST FOR PAINT.

AT the recent meeting of the American Society for Testing Materials, Mr. G. W. Thompson read a paper describing a simple test of the solubility of protective coatings in water. It has long been noted that certain protective coatings tended to wash, and that under certain conditions soluble compounds would come to the surface and form a gummy scum on the surface. Cases have been noted where the soluble compounds formed bitter and astringent solutions. Sometimes these soluble compounds would appear as miniature stalactites on the ceilings of porches.

The test which Mr. Thompson described was made with two pigments which he designated as "a" and "b." Six white pine boards, 30 inches long, 10 inches wide, and ⅞ inch thick, were primed with a mixture of pigment "a" and linseed oil, one-third boiled and two-thirds raw. When these priming coats were dry, mixtures of paint were prepared on approximately the same volume basis, that is, each paint contained the same actual volume of pigment and vehicle. The oil used was the same as for the priming coat, and contained no resinous compounds.

PIGMENTS USED ON THE BOARDS.

Board.	Pigment "a."	Pigment "b."
1.	100 per cent.	—
2.	80 per cent.	20 per cent.
3.	60 per cent.	40 per cent.
4.	40 per cent.	60 per cent.
5.	20 per cent.	80 per cent.
6.	—	100 per cent.

The paint was applied in two coats, spread at the uniform rate of 1,200 square feet to the gallon. The painting of these boards was done between October 16 and 22, 1909. When the paint was thoroughly dry, the boards were placed in a rack about 8 inches apart. The rack was covered with cheese-cloth to keep away the dust as far as practicable, and every working day, morning and evening, the under surfaces were sprayed by an atomiser and distilled water. Only so much water was sprayed on the boards as would remain there, and no dripping was allowed to occur.

The theory on which this test was conducted was that this constant spraying would gradually draw toward the surface of the paint any soluble compounds contained in it, and ultimately, if soluble compounds were formed, they would show as a scum on the surface of the paint. For the first month or two nothing developed; then on all of the boards containing pigment "b" the scum appeared, which gradually increased in amount. This scum is a brownish-looking mass, and appears to be composed of pigment "b" in combination with some organic substance. The formation of this organic compound or pigment "b" would appear to account in some cases for the washing and streaking of paint.

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TRADE NOTES.

THE manager of the Birtley Coal and Iron Co., opened a new clock by Messrs. Wm. Potts & Sons, Ltd., Newcastle and Leeds, last week, before a large crowd, it being the fiftieth year (jubilee) of the institute's erection. Messrs. Potts have lately erected two other new clocks in the county of Durham, and have a new clock, chimes, and bells for Ebchester parish church, near Gateshead-on-Tyne, and a clock for Shotfield Church, near London.

THE fire brigade of Hungerford, Berks, finding it next to impossible to obtain horses for their engine, set themselves to raise the necessary funds for purchasing a motor. Within six months sufficient money was subscribed to justify a contract being entered into with Messrs. Merryweather & Sons, the London fire engineers, for the purchase of one of their patent steam motor fire engines, of the well-known "Fire King" type, capable of discharging 300 gallons per minute. It was driven under its own steam from London to Hungerford, where it was tested last week and proved itself eminently satisfactory under the prevailing local conditions. Three days later it went to a call of fire at a farm about five miles out of Hungerford, arriving in record time and doing excellent work, notwithstanding the fact that some very soft ground had to be negotiated to get to the water. The engine was working through more than 1,800 feet of hose.

THE "Holdinslide" mount (Wright's patent) may be warmly commended to all architects who use cut-out mounting boards for any purpose, and who have therefore had painful experience of their shortcomings. The new patent is of the simplest character. The paper backing to the mount is cut crosswise in the centre, and the four triangular flaps so formed across the opening are slightly folded, and a small cross piece is pasted across two of them so as to make a sort of pocket. By this means the drawing, photograph, or whatever else it may be is inserted in a second or two, and remains exactly in position without the use of paste or any other adhesive. The mounts are made in sizes varying from 8 inches by 6½ inches to 44 inches by 32 inches, and in veneered, white, or tinted boards. They may be obtained at reasonable prices through all artists' colourmen, or from J. Wright & Co., Kew Gardens, S.W. We understand that the "Holdinslide" mount has already met with very considerable success.

THE HISTORY AND DEVELOPMENT OF REINFORCED CONCRETE.

INTRODUCTORY to a course of about sixty lectures on Reinforced Concrete which is to be given this session at the London County Council School of Building, Ferndale Road, Brixton, S.W., by Mr. H. Kempton Dyson, Secretary of the Concrete Institute, a special free public lecture on "The History and Development of Reinforced Concrete" was delivered on Tuesday, September 27, of which the following is a summary:—

It is only within recent years—namely, about the last twelve—that reinforced concrete as a method of construction has come into prominence. The subject, however, is not entirely new, because it is over fifty years since attention began to be directed by inventors thereto, and, indeed, reinforced concrete of a kind has been done for ages almost. The roof of a tomb constructed by the Romans one hundred years or more B.C., situated on the Via Appia, has been found to consist of a slab of lime concrete in which bronze rods were placed crossing each other latticeways to strengthen or reinforce it. In the wide sense the Romans reinforced concrete in other ways, by timber and tiles, while at one point it has been found that the Great Wall of China, on a bad subsoil, was built on a kind of concrete raft, in which timber, reeds, and rushes were embedded to strengthen it. In the Middle Ages timber was frequently employed to reinforce rubble concrete walls.

The first suggestion of an idea of reinforcing concrete in modern times seems to have been a statement in J. C. London's "Encyclopædia of Cottage, Farm, and Village Architecture," published in 1830, in which it was suggested that flat roofs might be constructed of a lattice work of iron tie rods thickly embedded in cement and cased with flat tiles. In 1840 about two systems of floor construction were employed in Paris, known as the Vaux and Thuasne systems; the former consisted of round rods, closely spaced, hooked over flat wrought-iron bars placed on the edge some distance apart, and embedded in a slab of plaster of Paris concrete; while the latter employed small iron joists with hangers or stirrups placed over them in which round rods were suspended, placed in holes in the stirrups. Plaster of Paris was, however, not a proper cement to be employed, as it caused the embedded iron to rust, and probably the reason reinforced concrete did not arrive sooner was that the world was waiting for a suitable cement for making concrete—it needed Portland cement, which was invented in 1824, but was not manufactured to any extent until some years later. The first real inventor of reinforced concrete in the modern sense seems to have been W. B. Wilkinson, a plasterer, of Newcastle-on-Tyne, who took out a patent for floors and beams of the same in 1854. M. Francois Coignet, a Paris contractor, took out a patent in 1855 for reinforcing slabs with a network of iron rods, and a M. Lambot, another French contractor, proposed the construction of ships by means of concrete with an embedded skeleton of wire, and he constructed a punt of the kind which was shown at the Paris Exhibition of 1853, and is still in service in a pond at Miraval, where he resided. The development of the subject was extended by the following inventors: C. C. Dennett (1857), Matthew Allen (1862), Frederick Ransome (1865), H. Y. D. Scott (1867), Philip Brannon (1870), who first suggested the driving of reinforced concrete piles, Monier (1867-1873), Thaddeus Hyatt (1873-1877), who conducted a great many tests on reinforced concrete beams, and showed how to make calculations for determining their strength, W. H. Lascelles (1877), W. E. Ward (1875), H. J. Jackson (1877), E. L. Ransome (1884), J. C. Golding (1884), W. H. Lindsay (1885), William Simmons (1885-6), who designed the block of offices No. 63 Lincoln's Inn Fields, London, which, constructed of reinforced concrete, is still in use and in excellent condition, Lee & Hodgson (1885), who invented a spirally reinforced concrete column, Bordenave (1887), Cottancin (1889), W. H. Briggs (1889), J. Mayoh (1890), A. J. B. Ward (1891), C. A. Day (1891), Franz P. Meyenberg (1891), who introduced the first loose stirrups in beams, F. G. Edwards (1891), P. Stuart (1892), Koenen & Wayss (1892), Francois Hennebique (1892). It is the last-named system which has been chiefly responsible for a great deal of the development in this country in recent years. There have been many systems invented subsequently, over seventy being upon the market in Europe and America to-day. Reinforced concrete is now used for the following:—Beams and slabs, cantilevers, arches, columns, piles, pipes, masts, telegraph, tramway and electric light poles and standards, reservoirs, barges, boats, punts, pontoons, caissons, ordinary walls, retaining walls, fence and fence posts, clothes posts, hitching posts, paths and pavements, cowhouses, piggeries, greenhouses, sheds, warehouses, offices, churches, houses, &c., railway sleepers, chimney shafts, sea protection walls and groynes, tables, window frames, safes, strong rooms, garden seats, cabinets and other furniture—yea, even tombstones and coffins. Reinforced concrete possesses the advantages of strength, durability, freedom from continual painting and upkeep, hygiene, fire resistance, freedom from vibration, and economy.

VARIETIES.

IT is reported that a well-known syndicate contemplates the erection of a large theatre in Market Street, Llanelly.

THE York City Council are negotiating for the purchase of the undertaking of the York Waterworks Company.

APPLICATIONS are invited by the Edinburgh Town Council for a burgh engineer and master of works at a salary of not less than 800*l.* a year.

THE Liverpool Architectural Society will open their 63rd session on Monday, October 3, when Mr. Arnold Thornely, F.R.I.B.A., will deliver his presidential address.

THE Preston Board of Guardians on Tuesday adopted a scheme for the provision of accommodation at the Ribchester Workhouse for the whole of the feeble-minded paupers in the Union, at a cost of 18,000*l.*

THE *Boletin Oficial* of the Argentine Republic publishes the text of a law empowering the executive authorities to erect a building for the use of the Administration of Internal Taxes, &c., at a cost of about 175,000*l.*

THE property surveyor to the Newcastle Corporation has been instructed to report on the possibilities of the present baths in Northumberland Road as a site for the proposed new town hall. The area is 4,030 yards.

DOUGLAS Town Council had before them last week the question of inviting competitive plans for the laying-out of the beautiful site of the Villa Marina, facing the bay, as a public garden, and the erection of a ballroom and organ at the cost of 20,000*l.*, for next season.

THE technical school, Smethwick, was opened on the 26th inst. The school has been erected in Crocketts Lane at a total cost, including equipment, of about 21,000*l.* It has been erected by Messrs. Webb & Son, Handsworth, the architect being Mr. J. F. Gill.

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MR. WALTER G. ROSS, A.R.I.B.A., has moved into new offices, and his address now is 4 Broad Street Buildings, Liverpool Street, E.C. His telephone number (Central 5775) will be retained.

MR. W. WILLIAMSON, Licentiate R.I.B.A., deputy city architect to the City Council of the Bradford Corporation, was appointed at their last meeting to be city architect in place of Mr. R. G. Kirkby, A.R.I.B.A., F.S.I., who recently resigned.

SIR JOHN WILSON, BART., of Airdrie, lord of the manor, has announced his intention of giving to Airdrie the sum of 10,000*l.* for the erection of a town hall. The town council were about to take a plebiscite on the proposal to erect such a building out of the rates.

DUNDEE Institute of Architects have elected office-bearers:—President, Mr. W. Fleming Wilkie; vice-president, Mr. G. P. K. Young; council, Messrs. Henry Thomson, James Findlay, C. G. Soutar, and T. M. Cappon; hon. treasurer, Mr. Charles Mann; hon. secretary, Mr. W. Salmond.

FOR the purpose of improving the condition of some of the back lanes near the centre of Sheffield by replacing old rubble sewers with earthenware pipe sewers, and by paving work, the Sheffield Corporation have applied to the Local Government Board for sanction to borrow 6,032*l.* The inquiry was held at the Town Hall last week by Mr. M. K. North, M.Inst.C.E., on behalf of the Board.

THE Sealand Tenants, Ltd., with a capital of 80,000*l.*, have commenced operations for the erection of a garden suburb to accommodate the increasing number of workmen employed about Connah's Quay and Shotton. Builders are engaged in the erection of the first lot of 400 houses. There will be a reading room, recreation grounds, and other facilities.

THE London Jewish Hospital Association are advocating a scheme for the erection of a hospital for Jews in the East End. It is desired to erect a small hospital with fifty beds for in-patients, together with a large out-patient department. The site of the proposed hospital has an area of 22,000 square feet, and is to cost 5,000*l.* The hospital when completed will cost from 15,000*l.* to 20,000*l.*

THE Polygon Baptist Church and schools, Southampton, were opened on Wednesday last. They are designed in Late Gothic, freely treated, facings of red pressed bricks with Bath stone dressings. The complete scheme embraces church with lofty tower, and spacious school premises. The buildings have been carried out for about 6,559*l.*, by Mr. J. Nichol, of Southampton, from designs by Messrs. George Baines & Son, architects, 5 Clement's Inn, Strand, London.

THE Finance Committee of the Liverpool City Council have approved of the site for the proposed memorial to King Edward VII., and have passed a resolution to the effect that the surveyor prepare plans for the alteration of the plateau at the south end of St. George's Hall, as shown on the model, but improving the steps.

ON Saturday a large blast was fired at Furnace Quarries, Lochfyne, N.B. A boring had been made into the face of the rock, in which was placed between seven and eight tons of gunpowder. It is estimated that between 80,000 and 100,000 tons of granite were displaced. The day was observed as a holiday.

THE Harrogate Corporation having passed plans for an additional storey at the Prospect Hotel, Harrogate, the proprietors have surrendered two strips of garden space to the Corporation, which will allow of the widening of the footpaths at the corner of St. James Street and West Park, and at the junction of Cambridge and Prospect Crescents.

THE sanction of the Local Government Board has been received at Torquay for the loan of 31,500*l.* for the erection of the new town hall and municipal buildings. A further communication will be addressed to the Town Council on the subject of the proposed loan of 15,000*l.* for the erection of the proposed pavilion in the Princess Gardens.

THE North-Eastern Railway Company contemplate making extensive alterations at Bridlington Station. It is understood that a new main entrance will be constructed between the entrance to the excursion platform and the existing main entrance. Additional platform accommodation will also be provided.

THE Board of Education having approved the plans and specification for the erection of a science, art, and technical block at Reading School, it is recommended that instructions be given to Messrs. Henry Cooper & Son, quantity surveyors, to prepare bills of quantities.

THE Middlesbrough plans committee last week approved of the plans, subject to the payment of 5*l.* per annum for pavement light, for the construction for Messrs. Newhouse & Co., Ltd., of a large drapery establishment, with lock-up shops on the site of the King's Head Hotel, at the corner of Linthorpe and Newport Roads. The plans provide for a four-storeyed steel-framed building, with basement.

A CONCRETE pipe line which has been completed in Ontario is declared to be unique in its engineering features among the great pipe lines of the Continent. It is the only one of its kind and size in the world. It is 18 feet in diameter, and 1¼ mile in length. Costing over 200,000*l.* it took only five months to complete. Resting on a solid foundation of concrete, it traverses a section of almost every known variety of soil. Rock, gravel, loam, and quicksand were encountered. The number of bags of cement used was 247,642, besides 2,350 tons of steel. Its walls are fully 18 inches in thickness.

PLANS for the extension of the Bede Collegiate School have been considered by the Sunderland Education Works Committee. It is proposed to erect a new school for boys at a cost of 13,500*l.*, and to use the existing premises for girls alone. There is also a proposal to adopt the adjoining Cowan Terrace School for preparatory students, and to provide for the elementary scholars now attending the school, either by erecting new premises or adding class-rooms to other schools in the district.

THE foundation stone of a square tower 85 feet high in course of erection at the west end of St. Paul's Church, Colwyn Bay, was laid on the 29th inst. The church was built twenty years ago in local limestone and red sand-stone dressings. These materials are to be utilised for the tower, which will cost 3,409*l.*, exclusive of clock, bells, fees, and other expenses. A prominent feature of the design are the eight large windows. Mr. J. Douglas, of Chester, is the architect.

AT a meeting of the Edinburgh District Board of Lunacy it was agreed to accept the estimates for four attendants' cottages and four farm cottages at Dechmont, the former to cost 1,411*l.* 6*s.* 4*d.*, and the latter 1,237*l.* 2*s.* 10*d.* The convener of the works committee said it was an indication of the keen competition that prevailed at the present time that the committee had had to examine 160 schedules. The highest offer was about 800*l.* more than what they had accepted, but all over the estimates were fairly close to each other. By their choice of contractors they had practically kept the work to Edinburgh firms.

IN regard to the projected erection in the Transvaal by the South African Steel Corporation of a plant for the manufacture of steel from iron and steel scrap, His Majesty's Trade Commissioner for South Africa reports that the works will be set up either at Tweefontein or on the Witwatersrand. The capital to be expended on plant, buildings, &c., is about 50,000*l.* The machinery is to consist of a small electric rolling mill, steam hammers, presses, an electric crane, and the necessary lathes and furnaces.

COMPETITION NEWS.

THE Ruthin Board of Guardians are to arrange a competition in connection with the proposed enlargement of the workhouse. Premiums of twenty and ten guineas will be offered.

MR. G. J. LAWSON, J.P., M.S.A., ex-Mayor of Bournemouth, has been appointed assessor in the competition for rebuilding J. E. Beale's premises, Bournemouth. The competition closes on December 1, and premiums of 100*l.*, 50*l.*, and 25*l.* are offered.

MESSRS. LEEMING & LEEMING, architects, 17 Old Queen Street, Westminster, have been appointed assessors in the competition organised by the Denbigh Town Council for a public hall, markets, municipal buildings, &c., which are to be erected at a cost of about 10,000*l.*

MR. A. H. FITZGERALD, M.S.A., of Tynemouth, has been awarded first prize of 100*l.* in the competition arranged by the Acton Urban District Council for schools at Rothschild Road for 850 pupils. The second premium of 50*l.* was awarded to Mr. P. Brocklebank, Southend-on-Sea; and a premium of 25*l.* to Messrs. Cheers & Smith, Twickenham and Blackburn.

THE *Moniteur des Intérêts Matériels* (Brussels) states that a competition is to be held of plans for a new school of engineers at Constantinople, to cost not more than 18,000*l.* Plans will be received up to October 14, at the "Direction de l'école d'ingénieurs, han de Rassim-Pacha, Bagtché-Capou, Stamboul-Constantinople." Prizes of 90*l.* and 45*l.* will be given.

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THE
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The International News Co., 5 Bream's Buildings, Chancery Lane, London, England, and New York.

AGENTS FOR CANADA:

Messrs. WM. DAWSON & SONS, Ltd., 91 Church Street, Toronto, to whom all correspondence for Subscription and Advertising Rates should be made.
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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

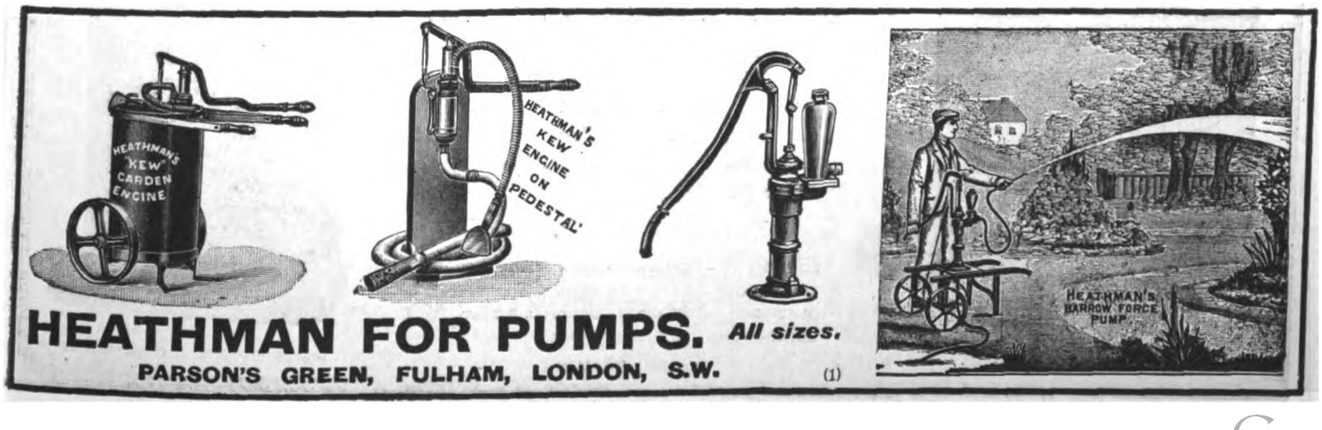
Bournemouth.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

Ireland.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

Ireland.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

Manchester.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

Romford.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached



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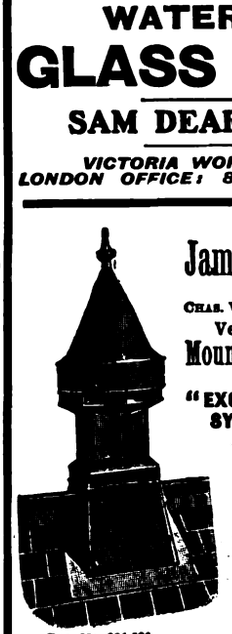
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cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

Ruislip.—Nov. 15.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

Tingley.—Oct. 29.—The committee of the Tingley Working Men's Club and Institute, Tingley, West Ardsley, offer a prize of 5*l.* 5*s.* for the best accepted design for their new club premises, the plans to be for a club suitable for accommodating 300 members. Mr. Jno. Hawthorn, secretary, Booth's Buildings, Tingley, near Wakefield.

CONTRACTS OPEN.

Askern.—For alterations to house, Askern, Yorks. Mr. H. J. Ward, architect, 6 Priory Place, Doncaster.

Barnsley.—For the various works required in extensions to the Model Lodging House, Pontefract Road. Forward names to Mr. Ernest W. Dyson, architect and surveyor, 10 Regent Street, Barnsley.

Barnsley.—Oct. 8.—For the erection of lavatory at St. John's Boys' school. Mr. Ernest W. Dyson, architect and surveyor, 10 Regent Street, Barnsley.

Bournemouth.—Oct. 14.—For erection of the Bournemouth Parcel Sorting Office and Telephone Exchange, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Postmaster, Bournemouth, or H.M. Office of Works, &c., Storey's Gate, S.W.

Chester.—Oct. 11.—For erection of a secondary school for boys and girls in Queen's Park. Deposit 1*l.* Mr. W. T. Lockwood, F.R.I.B.A., 88 Foregate Street, Chester.

Chester.—Oct. 17.—For a new annexe for 440 patients at the Upton Asylum. Deposit 3*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Deptford.—Oct. 18.—For (1) construction of flooring over first-class swimming-bath at Laurie Grove, New Cross; (2) alterations to building. Deposit 1*l.* 1*s.* Mr. J. Sutcliffe, A.M.Inst.C.E., borough surveyor, Town Hall, New Cross Road, S.E.

Dudley.—Oct. 11.—For the erection of hostel for women at Dudley Training College. (Messrs. Crouch, Butler & Savage, architects.) Send 2*l.* 2*s.* deposit by Oct. 11 to Mr. J. M. Wynne, director of education, Education Offices, Dudley.

Durham.—Oct. 18.—For erection of the following works for Durham education committee:—(1) Erection of schools at Benfieldside (for about 300 children), Hetton-le-Hole (for about 750 children), and Ushaw Moor alterations and additions, Mr. W. Rushworth, Shire Hall, Durham; (2) erection of Norton cookery centre, Mr. N. Richley, Shire Hall, Durham.

East Ham.—Oct. 18.—For erection of a playshed at Walton Road Council school. Mr. R. L. Curtis, architect to the committee, 11 and 12 Finsbury Square, E.C.

Edinburgh.—Oct. 12.—For the demolition of the old buildings of the slaughter-houses, Fountainbridge. Mr. James A. Williamson, A.R.I.B.A., City Chambers, Edinburgh.

Edinburgh.—Oct. 13.—For the following works to be executed in connection with the new school at Duncan Street, viz.:—Mason and brick, carpenter and joiner, steel and iron, plumber, slater, plaster, and painter works. Mr. J. A. Carfrae, architect, 3 Queen Street, Edinburgh.

Newburn.—Oct. 29.—For erection of proposed mortuary, roller shed and stable. Send 2*l.* 2*s.* deposit by Oct. 15 to Mr. Edward Cratney, architect, 88 Station Road, Wallsend-on-Tyne.

Glasgow.—Oct. 19.—For erection of the superstructure of the labour and telephone exchange, College Street, for the Commissioners of H.M. Works and Public Buildings. Mr. Kennedy, clerk of works, General Post Office, Hanover Street, Glasgow. Send 1*l.* 1*s.* deposit to H.M. Office of Works, 3 Parliament Square, Edinburgh.

Halifax.—Oct. 11.—For the erection of a wooden pavilion at Akroyd Park Bowling Green. Deposit 1*l.* Mr. James Lord, borough engineer, Town Hall, Halifax.

Handsworth.—Oct. 21.—The West Riding Education Committee invite whole or separate tenders for the following works:—Handsworth, Intake new infants' school (builder, joiner, slater, plumber, plasterer, and painter). Send 1*l.* deposit to the West Riding Treasurer, Wakefield. The Education Architect, County Hall, Wakefield.

Ilfracombe.—Oct. 13.—For erecting premises at 118 High Street. Mr. Allen T. Hussell, F.R.I.B.A., Market Square, Ilfracombe.

Leeds.—Oct. 14.—For repairs to the exterior of the Corporation Hotel, Camp Road, and for painting work in connection therewith, and also for painting the exterior of Cookridge Street baths and houses in Portland Crescent. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

Liverpool.—Oct. 12.—For the following work required at the Kirkdale branch workhouse:—(1) Joinery, wood block flooring, plastering; (2) wooden seating. The Vestry Clerk, Parish Offices, Brownlow Hill, Liverpool.

London.—For enlargement of the Census Office, consisting chiefly of iron buildings, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

London.—Oct. 13.—For erection of Deptford sorting office, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* Mr. J. Rutherford, H.M. Office of Works, Carlisle Place, S.W.

London.—Oct. 13.—For certain works of external repairs and painting at the North Infirmary of the parish, Dartmouth Park Hill, N. Mr. J. E. P. Hall, clerk, Town Hall, Pancras Road, N.W.

Maidstone.—Oct. 12.—For erection of a cart shed and scratching shed on the Asylum farm, also glass roof over iron staircase adjoining buildings. The Engineer, Kent County Asylum, Maidstone.

Margate.—Oct. 17.—For erection of a dust destructor. Mr. E. A. Borg, borough surveyor, 13 Grosvenor Place, Margate.

Midsomer Norton.—Oct. 17.—For the erection of a higher elementary school at Norton Hill. Mr. William F. Bird, M.S.A., Midsomer Norton, Somerset.

Monkwearmouth.—Oct. 25.—For an extension of goods warehouse and new offices for the North-Eastern Railway, at Monkwearmouth. Mr. Wm. Bell, Company's architect, Central Station, Newcastle-on-Tyne.

North Ormesby.—Oct. 12.—For the manual and team labour and materials required in the erection of a three-stall stable and the excavating, draining, forming, and paving, &c., of the stable yard, for the Urban District Council. Mr. Charles Hearder, surveyor, Council Offices, High Street, North Ormesby.

Pulborough.—Oct. 9.—For erection of a house and stables at Pulborough, Sussex. Messrs. Frederick Wheeler & Godman, architects, Bank Chambers, Horsham.

Redruth (Cornwall).—Oct. 15.—For the execution of the works required in respect of dilapidations at Redruth rectory and the buildings, fences and gates on the glebe. The Rev. H. W. Sedgwick, Treslothan Vicarage, Camborne, or Messrs. Smith, Paul & Sitwell, solicitors, Truro.

Reigate.—Oct. 15.—For supplying and erecting complete a disinfector at the new disinfecting station at the sewage disposal works, Earlswood. Mr. Fred. T. Clayton, C.E., borough engineer, Municipal Buildings, Reigate.

Salford.—Oct. 10.—For supplying and fixing an emergency iron staircase at the Trafford Road boys' school. The Director of Education, Education Office, Chapel Street, Salford.

Sheffield.—Oct. 11.—For erection of tramway passenger shelter at Fitzalan Market Side. The City Architect, Town Hall, Sheffield.

Startley.—For a cottage at Grove Farm, Startley, Great Somerford. Mr. Andrew Boa, county land agent, Stallard Street, Trowbridge.

Shotley Bridge.—Nov. 1.—For the erection of buildings for aged and infirm poor on the Whinney House Estate,

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Shotley Bridge, consisting of two pavilions of three floors, administrative block, &c. (Messrs. Newcome & Newcome, architects, Newcastle-upon-Tyne.) Send names by Oct. 12 to Mr. G. Craighill, union clerk, Poor Law Union Offices, Gateshead.

TIDWORTH.—Oct. 24.—For the erection of mortuary and disinfecting establishment, &c., at the Military Hospital, Tidworth, Salisbury Plain. Send 10*s.* deposit by Oct. 14 to the Director of Barrack Construction, 80 Pall Mall, London, S.W. (See advertisement.)

WAKEFIELD.—Oct. 21.—The West Riding Education Committee invite whole or separate tenders for the following works:—Wales Council school, alteration and additions (builder, joiner, slater, plumber, plasterer, painter, heating engineer). Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield. The Education Architect, Wakefield.

WALES.—Oct. 11.—For erection of a library and institute at Pengam, Mon. Deposit 1*l.* 1*s.* Mr. D. J. Thomas, High Street, Blackwood, Mon.

WALES.—Oct. 11.—For the erection and completion of twenty-two terrace houses in three blocks, and six pairs of semi-detached villas, together with the construction of roads, sewers, and surface water drains on the Meyrick Estate, Gwaelodygarth Field, Merthyr Tydfil. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WALES.—Oct. 12.—For the erection at Swansea of the following works, for the Glamorgan County Territorial Force Association: Headquarters block, for six units, with officers' mess; riding school, 150 feet by 53 feet 6 inches, with stable, magazine, and yard adjoining; drill-hall, 150 feet by 80 feet, with caretaker's cottage, lavatories, and miniature rifle range adjoining; re-erection of existing gateway in altered position, new entrance from Richardson Street; also latrines and sundry works to existing sheds. Deposit 3*l.* 3*s.* Mr. C. H. Rogers, architect, 10 Quay Parade, Swansea.

WALES.—Oct. 12.—For the following works, viz.:—(1) Council school at Heolyciw, near Pencoed; (2) foundations, &c., for temporary building at Kenfig Hill; (3) additions to the Council school at Llanharan; (4) a boundary wall and railings at Porth County school, for the Glamorgan County Council. Mr. T. Mansel Franklen, clerk, Westgate Street, Cardiff.

WALES.—Oct. 12.—For the erection of a caretaker's office and storeroom and the formation of two new footpaths at Tonyrefail burial ground, for the Llantrisant Parish Council. Messrs. Arthur Ll. Thomas & Gomer S. Morgan, architects and surveyors, Pontypridd.

WALES.—Oct. 15.—For alterations and repairs to the farm house and outbuildings on Lower Hasguard Farm, Pembrokeshire. Mr. Arthur H. Thomas, A.R.I.B.A., county surveyor, Haverfordwest.

WALES.—Oct. 15.—For the erection of a chapel at Court Street, Merthyr Tydfil. Mr. T. Edmund Rees, architect, Merthyr Tydfil.

WALES.—Oct. 15.—For erection of premises in Commercial Street, Mountain Ash, for the Constitutional Working Men's Club, Ltd. Deposit 1*l.* 1*s.* Messrs. Morgan & Elford, architects, 1 Jeffrey Street, Mountain Ash, or 31 Canon Street, Aberdare.

WALES.—Oct. 16.—For the erection of laundry and stables for the Tredegar and District Laundry Co., Ltd. Send 1*l.* 1*s.* deposit by Oct. 9. Mr. A. F. Webb, architect, High Street, Blackwood.

WALES.—Oct. 16.—For the erection of twenty houses off Brompton Terrace, Tredegar, for the Vale View Building Club. Mr. A. F. Webb, architect and surveyor, High Street, Blackwood.

WALES.—Oct. 17.—For erection of villa at Pentre. Mr. W. D. Morgan, M.S.A., 194 Ystrad Road, Pentre.

WALES.—Oct. 17.—For carrying out certain alterations, repairs, papering and painting, &c.:—(a) The Commercial Inn, Talywain; (b) the Montague Hotel, Pontypool, for Messrs. A. Buchan & Co., Rhymney. Mr. Thomas Roderick, architect, Aberdare.

WALES.—Oct. 18.—For the erection of a police station at Ynysddu. Mr. William Tanner, F.S.I., county surveyor.

WALES.—Oct. 19.—For erection of a chapel at Caersws. Deposit 1*l.* 1*s.* Mr. R. W. Davies, M.S.A., architect, &c., Dolafon, Carno.

WESTBERE.—Oct. 10.—For erection of a small set of farm buildings and alterations and additions to a cottage at Rushbourne, Kent. Mr. Albert Barker, land agent, 38 King Street, Maidstone.

WETHERBY.—For the various works required in the erection of a golf club house at Wetherby, Yorks. Messrs. Oliver & Dodgshun, architects, 18 Park Row, Leeds.

WHITCHURCH.—Oct. 14.—For erection of a secondary school at Whitchurch, Salop, to accommodate 140 pupils. Deposit 2*l.* 2*s.* Mr. J. Holt, architect, 9 Albert Square, Manchester.

WINCHMORE.—Oct. 28.—For erection of an infants' school at Winchcombe, Gloucestershire. Deposit 2*l.* 2*s.* Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

WOOLWICH.—Oct. 19.—For the following work:—The erection of 15b and 15c types of married soldiers' quarters in one block of flats at Artillery Place, Woolwich, in the Eastern Command. Send 10*s.* deposit by Oct. 10. The Director of Barrack Construction, 80 Pall Mall, London.

TENDERS.

BLOOMFIELD.

For constructing small road bridge at Mill Road, for Chelmsford Rural District Council. Mr. F. E. H. POWELL, surveyor of highways.

Brettall & Co.	£264 14 2
Faircloth	238 7 0
Choate & Son	218 5 0
Gowers	205 0 0
Eglin & Co.	196 3 0
Bailey	189 19 8
SIMMONDS, Chelmsford (*accepted*)	189 8 2

CONGLETON.

For the construction of the Malkins Bank Sewage Disposal Works. Mr. W. WOODLEY WYATT, engineer, Whitchurch, Salop.

Forster	£674 6 0
Graham	555 8 9
Bentley & Co.	490 0 0
Williams	469 0 0
Worthington, Ltd.	444 4 5
Standeven	430 0 0
Sanders & Torrance	426 19 0
Stringer	426 8 7
Hutton & Co.	377 5 8
Taylor & Son	374 12 8
BARKE & SON, Stoke-on-Trent (*accepted*)	371 15 9

HANSLOPE (BUCKS.).

For the construction of dry well, the erection of engine house with pumping machinery, cast-iron water tower and staging, and the supply, laying, and jointing of about 4 miles 200 yards of 5-inch, 4-inch, and 3-inch cast-iron socket pipes, with their appendages, including all necessary sluice and air valves, hydrants, and other works, for the water supply of the parish of Hanslope, for the Newport Pagnell Rural District Council. Messrs. BEESLEY, SON & NICHOLS, MM.I.C.E., engineers, 11 Victoria Street, Westminster.

Finnegan	£4,750 0 0
Osenton	4,642 0 0
Raynor	4,565 11 0
Dickson	4,498 0 0
Cottle	4,227 17 6
Higgins	4,130 0 0
Ashley	4,077 0 0
Macdonald	3,970 0 0
STAVELEY COAL AND IRON CO., Chesterfield (*accepted*)	3,793 19 0
Engineers' estimate	4,075 0 0

IRELAND.

For the construction of a concrete service reservoir, &c., about two miles from Ballymoney Waterworks, for the Ballymoney Urban Council.

Hill	£578 10 0
McNally	561 2 10
Christie	558 6 10
Fleming Bros.	543 11 1
Thompson	505 0 0
Higgerty	496 0 0
HENRY, Ballymoney (*accepted*)	496 0 0

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KINGSTON-UPON-THAMES.

For levelling, metalling, channelling, kerbing, gravelling, sewering and lighting the portion of Gloucester Road from Cambridge Road to Coombe Road, for the Corporation. Mr. R. HAMPTON CLUCAS, surveyor.

Trueman	£4,004 19 0
Pedrette	3,956 0 0
Dykes & Smith	3,889 0 0
Free & Sons	3,844 0 0
Wheeler & Co.	3,647 0 0
Parry & Co.	3,480 0 0
Mowlem & Co.	3,216 0 0
Bailey & Weller	3,188 0 0
KAVANAGH & Co., Surbiton (*accepted*)	3,087 0 0

LONDON.

For building vicarage house for the benefice of All Hallows, East India Road. Messrs. HEAZELL & SONS, architects, Nottingham.

Knight	£2,685 0 0
Newell & Lusty	2,400 0 0
F. & T. Thorne	2,278 0 0
Maddison	2,217 0 0
Barratt & Power	2,159 0 0
JERRAM, East Ham (*accepted*)	1,975 0 0

For extensions to laundry at the Brentford Union Workhouse, Isleworth. Messrs. W. H. WARD, architects, Paradise Street, Birmingham.

Pedrette	£3,977 0 0
Plaistowe	3,349 0 0
Sandon	3,302 0 0
Love	3,240 0 0
Clifton	3,115 0 0
Jarman & Co.	2,998 0 0
Strong & Co.	2,984 0 0
Ferris Bros.	2,981 0 0
Wall	2,948 0 0
Clarke	2,921 10 0
Bradford	2,819 0 0
Dickens	2,800 0 0
Eyles	2,795 0 0
Lown & Co.	2,740 10 0
Gough & Co.	2,703 0 0
Messom & Sons	2,612 0 0
Dorey	2,598 0 0
Bovis & Co.	2,597 0 0
LACEY, Hounslow (*accepted*)	2,568 0 0

For the erection of a school to accommodate 1,500 children, in Gainsborough Road, Canning Town. Messrs. WILLIAM & JOHN H. JACQUES, architects, 2 Fen Court, E.C.

Leslie & Co.	£25,795 0 0
Monk & Co.	25,520 0 0
Wall, Ltd.	25,321 0 0
Longley & Co.	24,985 0 0
Patman & Fotheringham, Ltd.	23,943 0 0
Fitch & Cox	23,590 0 0
Spencer, Santo & Co.	22,930 0 0
Brand, Pettit & Co.	22,793 0 0
Moss	22,652 0 0
Wallis & Sons, Ltd.	22,587 0 0
Lawrence & Sons	22,472 0 0
Willmott	22,212 0 0
Webb & Co.	21,864 0 0
Nightingale	21,672 0 0
Maddison	21,169 0 0
Coxhead	20,978 0 0
Horswill	20,953 0 0
SYMES, Stratford, E. (*accepted*)	20,477 0 0

Extra if plastering walls in lieu of dinging.

Wall	£331 0 0
Fitch & Cox	296 0 0
Longley & Co.	245 0 0
Maddison	235 0 0
Willmott	200 0 0
Wallis & Sons	179 0 0
Monk & Co.	198 0 0
Spencer, Santo & Co.	178 0 0
Webb & Co.	152 0 0
Leslie & Co.	144 0 0
Brand, Pettit & Co.	130 0 0
Symes	129 0 0
Moss	116 5 6
Nightingale	103 0 0
Horswill	94 0 0
Coxhead	93 10 0
Patman & Fotheringham	50 0 0

LONDON—*continued.*

For cleaning, whitewashing, &c., at the Central Criminal Court, for the Corporation.

Holloway Bros.	£361 0 0
Mason & Co.	293 0 0
Inns	278 0 0
SHAW (*accepted*)	244 0 0

For the erection of a police section house at City Road. Mr. J. DIXON BUTLER, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Galbraith Bros.	£12,500 0 0
Todd & Newman	12,019 0 0
McCormick & Sons	12,065 0 0
F. & H. F. Higgs	11,990 0 0
Jarvis & Sons	11,980 0 0
Barker & Sons	11,828 0 0
Roome & Co.	11,670 0 0
Killby & Gayford	11,533 0 0
Lovett	11,512 0 0
Blake	11,500 0 0
Shurmur & Sons	11,496 0 0
Lole & Co.	11,452 0 0
Prestige & Co.	11,429 0 0
Godson & Sons	11,367 0 0
Mowlem & Co.	11,347 0 0
Fairhead & Son	11,333 0 0
Patman & Fotheringham	11,283 0 0
Grover & Son	11,173 0 0
Sabey & Son	11,111 0 0
Fryer & Co.	11,077 0 0

MARKET RASEN.

For carrying out various works required in alterations and additions to the Wesleyan ministers' houses at Market Rasen. Mr. C. ERNEST KENDALL, architect, Market Rasen, Lincs.

Horton	£297 0 0
Clarke	275 0 0
Sutton	257 0 0
SANDERSON, Market Rasen (*accepted*)	251 0 0
Architect's estimate	260 0 0

OCKFORD (NEAR GODALMING).

For erection of new pumping station buildings at Ockford, near Godalming, for the Town Council. Mr. J. H. NORRIS, borough surveyor and water engineer.

Humphreys & Sons	£1,145 0 0
Mitchell Bros.	875 0 0
Milton & Sons	875 0 0
Fry	874 0 0
Chapman, Lowry & Puttick	874 0 0
Crossby & Co.	870 0 0
Chapman & Co.	850 0 0
Cook & Sons	849 0 0
Drowley & Co.	849 0 0
Seward	839 0 0
GATHERCOLE BROS., London Road, Norbury (*accepted*)	800 0 0

POLSEATH.

For erection of a bungalow at Polseath, near Wadebridge, Cornwall. Mr. ARTHUR GILBERT, architect, Torpoint.

Bennett	£1,225 0 0
Miners	1,075 0 0
STANBURY, Devonport (*accepted*)	1,000 0 0
Derrent	720 0 0

STANNINGTON.

For additions to Children's Sanatorium (Lady Stephenson's Wing). Mr. D. M. SPENCE, architect and surveyor, Shotley Bridge.

Tweddle	£4,035 0 0
J. & W. Lowerys	4,028 17 0
Thompson & Dennison	3,986 0 0
Hall	3,893 0 0
Tringle	3,837 0 0
White	3,810 0 0
Bowers	3,715 12 7
George & Son	3,680 0 0
R. & G. Brown	3,647 13 9
Carse & Son	3,588 0 0
Henderson & Son	3,554 0 0
Green & Sons	3,398 12 0
BROWN & TOMPKINS, Consett (*accepted*)	3,324 5 10

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RYE.

For the erection of the Rye International Stores. Messrs. G. Baines & Son, architects, 5 Clements Inn, London.

Estimate A.

Lewis & Sons	£1,670 0 0
Harvey	1,498 10 0
Bainbridge & Son	1,495 0 0
Burnham & Son	1,430 0 0
Horsell	1,404 0 0
Ellis Bros.	1,398 0 0
Knock	1,275 0 0
Fuller & Sons	1,259 9 6
Hutchinson & Co.	1,098 0 0

Estimate B.

Horsell	117 0 0
Burnham & Son	110 5 0
Ellis Bros.	98 15 6
Harvey	98 0 0
Hutchinson & Co.	98 0 0
Bainbridge & Son	91 0 0
Fuller & Sons	87 1 6
Lewis & Sons	70 15 0
Knock	63 15 0

Estimate C.

Burnham & Son	310 0 0
Hutchinson & Co.	302 0 0
Bainbridge & Son	297 0 0
Ellis Bros.	294 0 0
Harvey	289 0 0
Knock	275 0 0
Fuller & Sons	250 7 2
Horsell	232 0 0
Lewis & Sons	202 14 0

Estimate D.

Fuller & Sons	70 0 0
Harvey	45 0 0
Burnham & Son	44 0 0
Ellis Bros.	42 10 0
Lewis & Sons	34 18 0
Knock	32 15 0
Horsell	32 4 0
Hutchinson & Co.	31 0 0
Bainbridge & Son	31 0 0

Estimate E.

Knock	50 0 0
Horsell	46 16 0
Lewis & Sons	40 0 0
Hutchinson & Co.	35 0 0

SCOTLAND.

For enlargement of St. Elvan's Church, Aberdeen. Mr. G. E. Halliday, F.R.I.B.A., Cardiff.

Allen	£4,777 10 0
Hallett	4,752 0 0
Blacker Bros.	4,714 0 0
Davies	4,710 0 0
Turner & Sons	4,645 0 0
Walliams	4,613 0 0
Cox & Bardo	4,598 16 3
Knox & Wells	4,497 0 0
Morgan & Sons, Aberdeen (*accepted*)	4,428 18 0
Stephens & Bastow	4,396 0 0
Jamsbury & Co.	4,326 0 0

SITTINGBOURNE.

For the erection of temporary buildings at the County School. Mr. Wilfrid H. Robinson, architect.

Smith & Co.	£703 0 0
Ginger, Lee & Co.	698 10 0
McManus	590 0 0
Harbrow	567 0 0
Seager	549 0 0
Monk	537 0 0
Tidy	512 0 0
Pavey	497 0 0
Bowes, Milton Regis (*recommended*)	446 10 0

WALES.

For the erection of from forty to fifty houses, for the Duffryn Rhondda Building Club. Mr. Frank B. Smith, C.E., architect and surveyor, Port Talbot.

Rankin	£345 12 7
Colborne	298 17 0
Newman	269 0 0
Jones, Caerau (*accepted*)	252 0 0

WEST HAM.

For painting, cleansing and repairing various public buildings, for the Borough Council. Mr. J. G. Morley, borough engineer.

Brand	£1,203 15 4
Clutterbuck	1,095 13 2
Fenn	952 3 7
Stoneley & Co.	887 10 0
Beaumont & Sons	878 10 0
Stokes & Son	845 11 11
Lovely	780 0 0
Jerram	767 10 0
Woollaston & Co.	745 0 0
Barker & Co.	704 12 0
Burns & Co., Plaistow (*accepted*)	697 0 0
Upton & Co.	444 3 0
Smith	281 6 0
Tucker	196 0 0

WOLVERHAMPTON.

For erection of a drill hall in New Hampton Road, for the Staffordshire Territorial Forces Association. Mr. C. G. Cowlishaw, architect, Hanley.

Gough & Son	£5,400 0 0
Perry	5,392 0 0
Round & Sons	5,375 0 0
Lovatt	5,279 0 0
Willcock & Co.	5,250 0 0
Heath	4,973 0 0
Cave & Son	4,960 0 0
Godwin, Stoke-on-Trent (*accepted*)	4,930 0 0

The York Board of Guardians last week adopted plans for alterations at the workhouse to cost 12,000*l*. The alterations, which are proposed under pressure from the Local Government Board, include a new labour yard and test workshops, new porter's lodge, tramp wards and receiving wards, a new administrative block, and a remodelling of the maternity ward.

The United States Geological Survey report that the total production of Portland cement in that country during last year was 62,508,461 barrels, being over ten million barrels more than the total for the preceding twelve months. Its value is put at $50,510,385. The production of natural cement was 1,527,279 barrels, and of Puzzolan 160,646 barrels. These figures show comparatively little variation.

According to the British Acting Consul-General building is proceeding rapidly in Panama, Colon, and the Canal zone, and the Government has made several contracts for the erection of public buildings, including a national institute to cost 150,000*l*. All houses and tenements are of wood, and naturally the heavier materials, such as lumber, mouldings, doors, blinds, and sashes, come entirely from the United States; but British firms can and do to some extent compete in corrugated iron, cement, zinc, lead, paints, oils, putty, hinges, bolts, locks &c.

For the past twelve years the Belfast Corporation has been endeavouring to find a system of sewage disposal suitable to the unusual condition of Belfast Lough, with its stretches of slobland foreshore. A number of experiments have been made. The Corporation have now adopted sedimentation tanks, instead of the expensive bacteriological treatment, and by this method it is expected that a large sum will be saved, and a high degree of purification of sewage will be obtained. The total figures are not yet available in regard to the cost of the scheme, but up to February last loans amounting to 104,000*l*. had been sanctioned, while the additional amount estimated as still required is 51,000*l*., irrespective of the 10,000*l*. for the Sydenham drainage scheme. The sedimentation method of sewage treatment, which was commenced locally in 1908, entails the construction of tremendous tanks, now being completed by Messrs. J. & W. Stewart, and the conveyance of the sludge by steamer to below Blackhead, where it will be deposited in the sea. The bacteria beds, though still in use, are now rendered obsolete by the new sedimentation tanks, which are capable of containing 9,000,000 gallons.

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CANBERRA, THE AUSTRALIAN FEDERAL CITY.

THE Commonwealth Government having selected Canberra, in New South Wales, as the site of the proposed Federal capital, it has been decided to invite competitive designs for laying it out from all parts of the British Empire. In anticipation of this an elaborate survey has been commenced. The boundaries of the new Federal territory will first be delimited, and then a contour survey of the City proper made. When this has been completed lithographic plans will be printed and sent to all parts of the Empire, with the fullest information for intending competitors, who will have to make provision for the location respectively of the viceregal residence, Parliamentary buildings, public offices, university, military barracks, and other groups of buildings. The site, which is one of the most beautiful in Australia, affords abundant facilities for the construction of one of the finest modern cities in the world, some idea of its character being afforded by the illustrations in this issue.

THE TOWN-PLANNING AND HOUSE EXHIBITION, GIDEA PARK, 1911.

SINCE the preliminary notice of the Town Planning and Modern House and Cottage Exhibition, to be held at Gidea Park, Squirrel's Heath, in the Romford Garden Suburb, in June and July, 1911, was published in the last week in August, the response obtained from architects and builders has been of such a character as to render the complete success of the exhibition from an architectural point of view certain. It may be expected to attract a large amount of attention, and to exert a far-reaching influence on house building in Outer London. Architects should observe that the latest date for receiving designs for houses and cottages to be erected is October 31.

The directors of the new garden suburb at Gidea Park are taking active steps to obtain a type of house in the suburb which will mark a definite advance in suburban architecture. In addition to the houses which are being designed for next year's Exhibition, a considerable number of houses and some shops are now being designed for the estate by distinguished architects, among whom are Messrs. Bateman & Bateman, Mr. Ernest W. Gimson, Mr. C. E. Mallows, F.R.I.B.A., Mr. Edgar Wood, A.R.I.B.A., Mr. M. H. Baillie Scott, Mr. Edward J. May, F.R.I.B.A., Mr. C. S. Spooner, F.R.I.B.A., Mr. T. Geoffrey Lucas, A.R.I.B.A., Mr. W. Curtis Green, A.R.I.B.A.

The distinguished list of vice-presidents given below shows the remarkable interest which these competitions have aroused outside the architectural profession:—

President, the Right Hon. John Burns, M.P., President of the Local Government Board; Vice-Presidents (preliminary list): the Earl of Warwick (the Lord Lieutenant of Essex), the Countess of Warwick, Lord Claud John Hamilton (Chairman of the Great Eastern Railway Company), the Bishop of London, the Bishop of St. Albans, Lord Rayleigh, Lady Rayleigh, Lord O'Hagan, the Right Hon. Mark Lockwood, P.C., M.P., Sir J. Fortescue Flannery, Bart., M.P., Sir John Bethell, M.P., Andrew Johnson, Esq. (Chairman Essex County Council), Arthur T. Keen, Esq. (President of the Architectural Association), C. A. McCurdy, Esq., M.P., E. G. Pretyman, Esq., M.P., H. H. Raphael, Esq., M.P., J. W. Robertson Scott, Esq., J. A. Simon, Esq., K.C., M.P., Leonard Stokes, Esq. (President of the Royal Institute of British Architects), John St. Loe Strachey, Esq., Alderman William Thompson (Chairman of the National Town Planning and Housing Council), J. C. Thresh, Esq., M.D. (Medical Officer of Health for the County of Essex), J. Tudor Walters, Esq., M.P., H. G. Wells, Esq., F. Whitmore, Esq. (architect to the Essex County Council). The judges are Mr. E. Guy Dawber, Mr. H. V. Lanchester, and Mr. Mervyn Macartney.

The principal feature of the Exhibition will be of course the competition in connection with the actual designing and building of cottages and houses of moderate size.

The competition is not restricted, however, as in the case of the Cheap Cottage Exhibition at Letchworth five years ago, to a type of dwelling in which the most drastic economies are imperative at every stage. For a house at 500*l.* the gold medal of the exhibition and 250*l.* will be awarded, and for a cottage at 375*l.* a second medal and 200*l.* Cottages at such prices admit of artistic treatment, and from a builder's point of view are a practical proposition. In addition to these prizes, there are second prizes of 100*l.* in each class, a prize of 50*l.* for the internal fittings, and the directors of the "Romford Garden Suburb," as the new suburb has been christened, will purchase at exhibition prices twelve of the houses and cottages, and will advance to competitors who desire it three-fourths of the cost of erection. The builder has also been remembered in this exhibition; a gold medal, and two prizes of 100*l.* and 50*l.*, are given for excellence of workmanship to the actual builders of exhibition cottages. In all a sum of 1,000 guineas has been set aside by Mr. H. H. Raphael, M.P., for prizes.

To architects this ample recognition of the value of their services in building a new London must be gratifying; to the conscientious builder the exhibition offers an opportunity of making the quality of his work known to hundreds of architects and to the public at large. The exhibition will be a well-organised and important attempt to discover the best architectural and building skill available to the man of moderate means who wants a cheap house and a good house, which will at the same time not be an eyesore to the man of taste. The offices of the exhibition are at 33 Henrietta Street, Strand, W.C. Mr. Michael Bunney, A.R.I.B.A., is acting as the hon. secretary.

COMPETITION NEWS.

MR. H. P. BURKE DOWNING, F.R.I.B.A., has been nominated by the President of the Royal Institute and appointed by the Governors as assessor in the competition, limited to East Anglian architects, for the new Institution for Blind and Deaf Children to be erected at Gorleston-on-Sea, Great Yarmouth.

MR. F. W. MARTIN, architect, Birmingham, has prepared plans for a new children's hospital to be erected in Birmingham as a memorial to King Edward. The committee appealed for the sum of 50,000*l.* to cover the cost of the hospital and of an equestrian statue. Of this amount nearly 28,000*l.* has been raised by subscriptions.

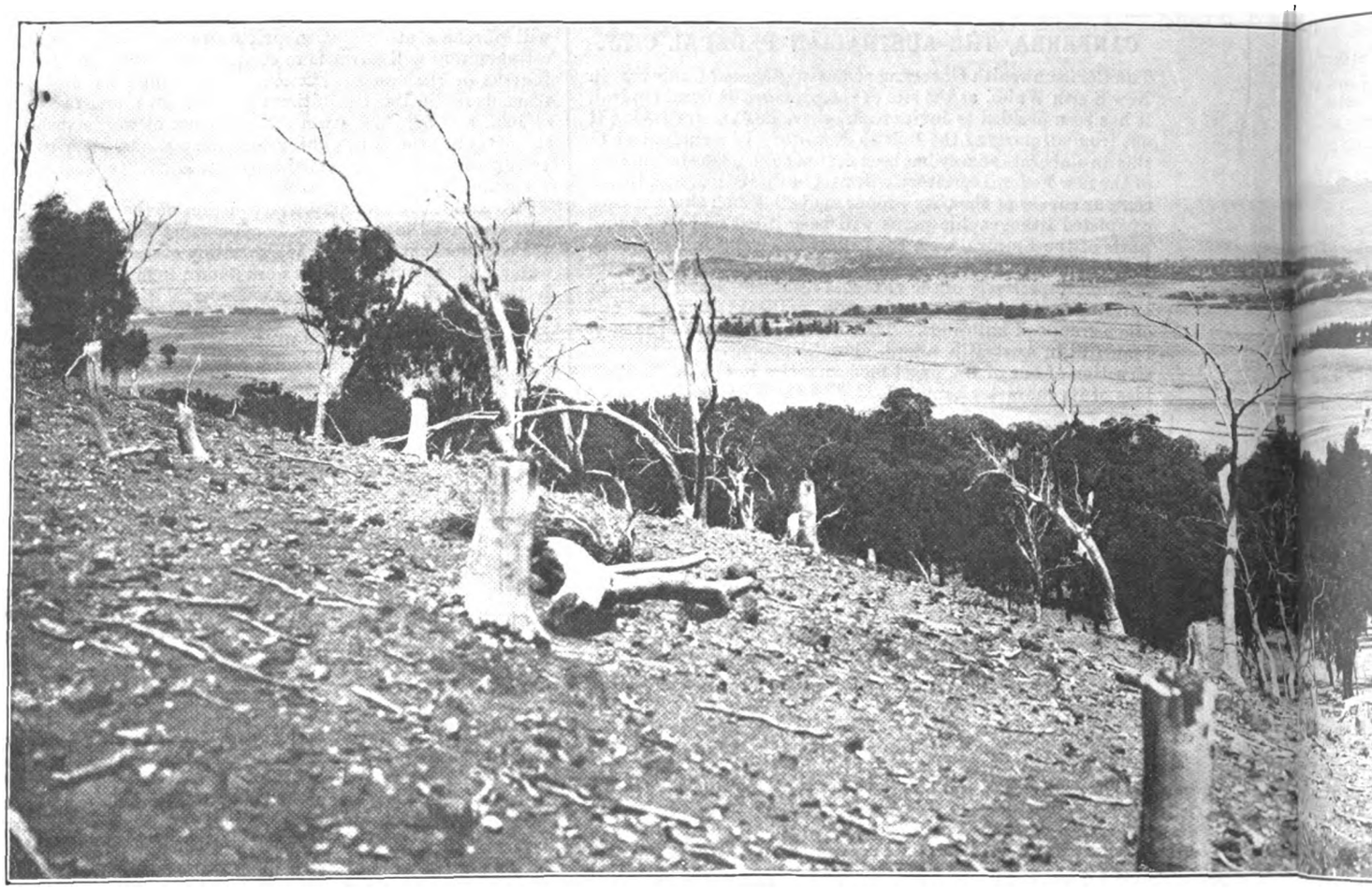
THE Sixth Annual All-Ireland Industrial Exhibition was opened in Cork on Monday last. At the Conference the following resolution was down for discussion on the 4th inst.: "That, in the opinion of this Conference, satisfactory support is not being extended to Irish building materials in general; and that Irish architects, engineers, builders, and contractors should, in the interest of the well-being of this country, specify and use, wherever possible, materials of Irish production and manufacture."

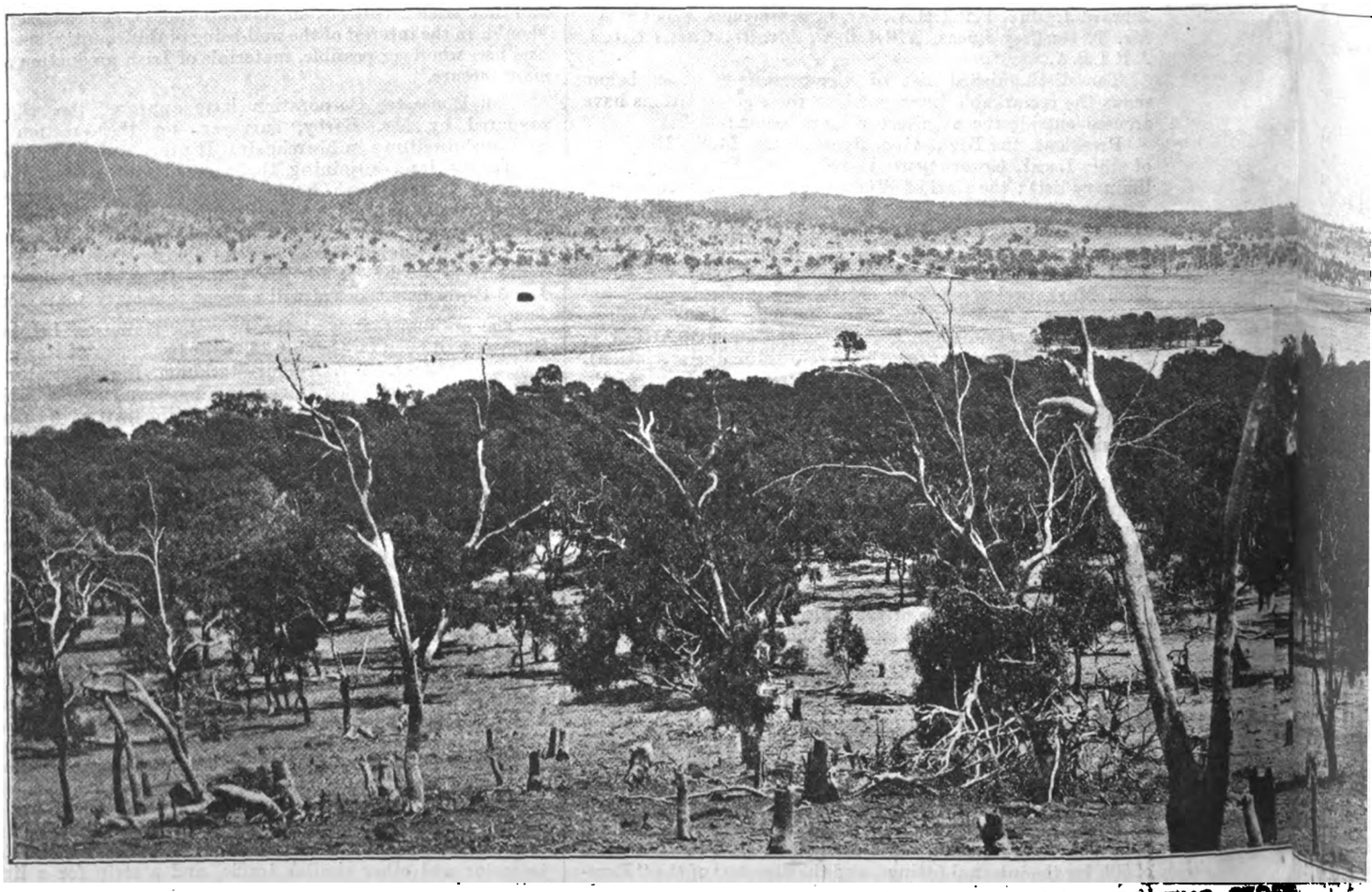
THE Doncaster Corporation have approved the scheme prepared by Mr. Kirby, surveyor, for the erection of artisans' dwellings in Marchgate. It provides for 140 houses on vacant land adjoining the new bridge, reserving the frontage to the North Bridge Road for business premises. The estimated cost, allowing for the value of the land at 4*s.* per square yard, is about 31,500*l.*, and the scheme proposes the letting of the houses to working-class tenants at rents from 4*s.* 6*d.* to 5*s.* per week. It is hoped that the Local Government Board will consent to a sixty years' loan.

The autumn season at the Leicester Galleries, Leicester Square, will open on October 15, with two shows of considerable importance. Mr. Arthur Rackham, the illustrator of "Peter Pan" and other fairy books, has been engaged during the past year on a series of drawings illustrating Wagner's "The Ring of the Niblungs." The coming exhibition will consist of the first two parts of the famous tetralogy, viz., "The Rhinegold" and "The Valkyrie," and it is hoped that Mr. Rackham will be able to complete the two remaining operas in another twelve months. At the same time an exhibition will be held of Mr. Hugh Thomson's water-colour drawings illustrating "The Merry Wives of Windsor," "As you like it," and "Esmond."

A CONFERENCE was held at West Hartlepool last week among the local authorities concerned in the proposed new direct road from West Hartlepool to Middlesbrough. The meeting resolved that it was of the greatest importance that improved road facilities should be obtained, and the scheme now put forward by the Borough of West Hartlepool would give the facilities required. The meeting pledged itself to support by all means in its power an application to the Road Board for the advances necessary for the construction and maintenance of the proposed road. The estimated cost of the road, which will provide not only for pedestrian and heavy slow traffic, but a section of which will also be devoted to motor and other similar traffic, and a strip for a light railway, is 57,000*l.*

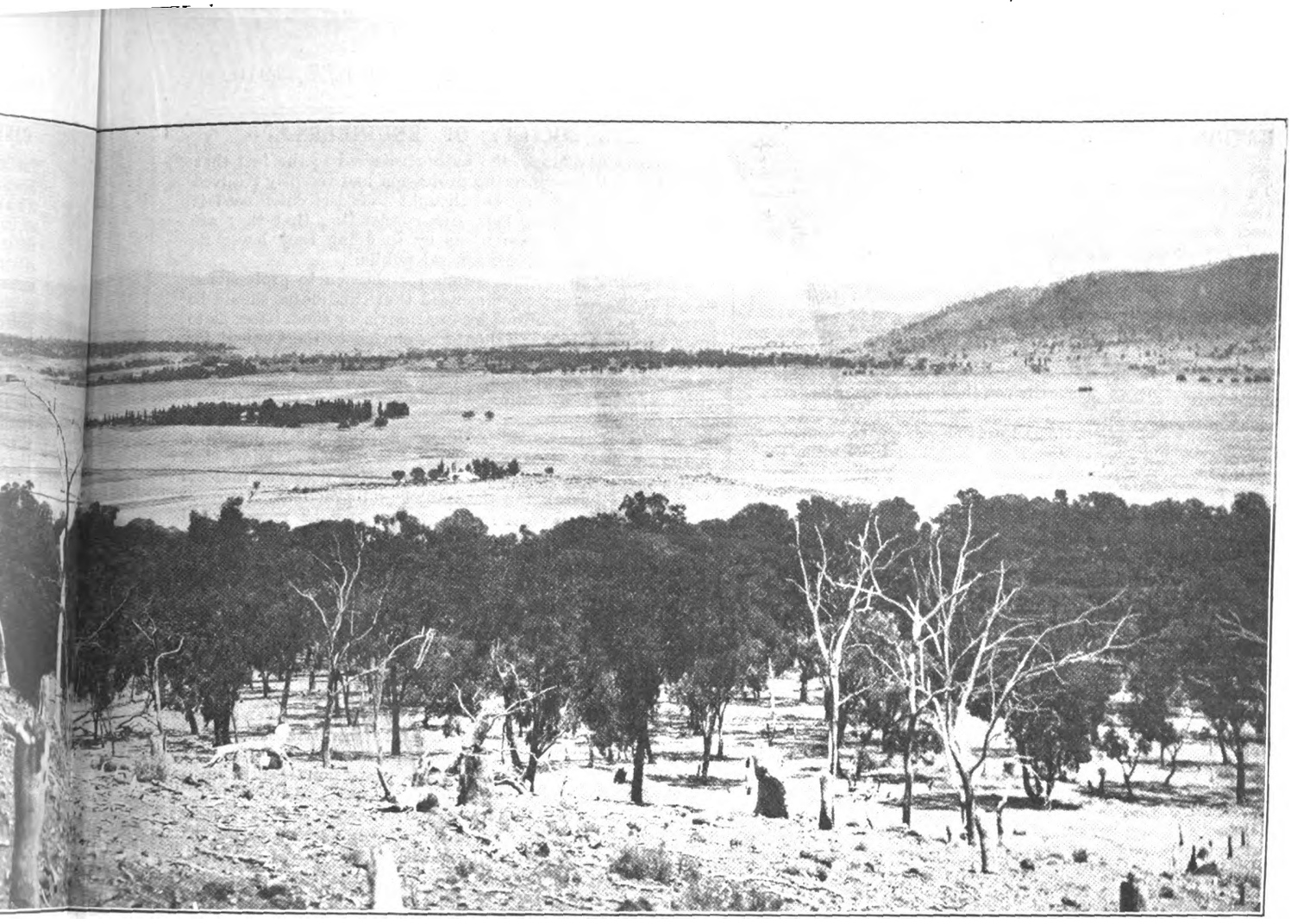
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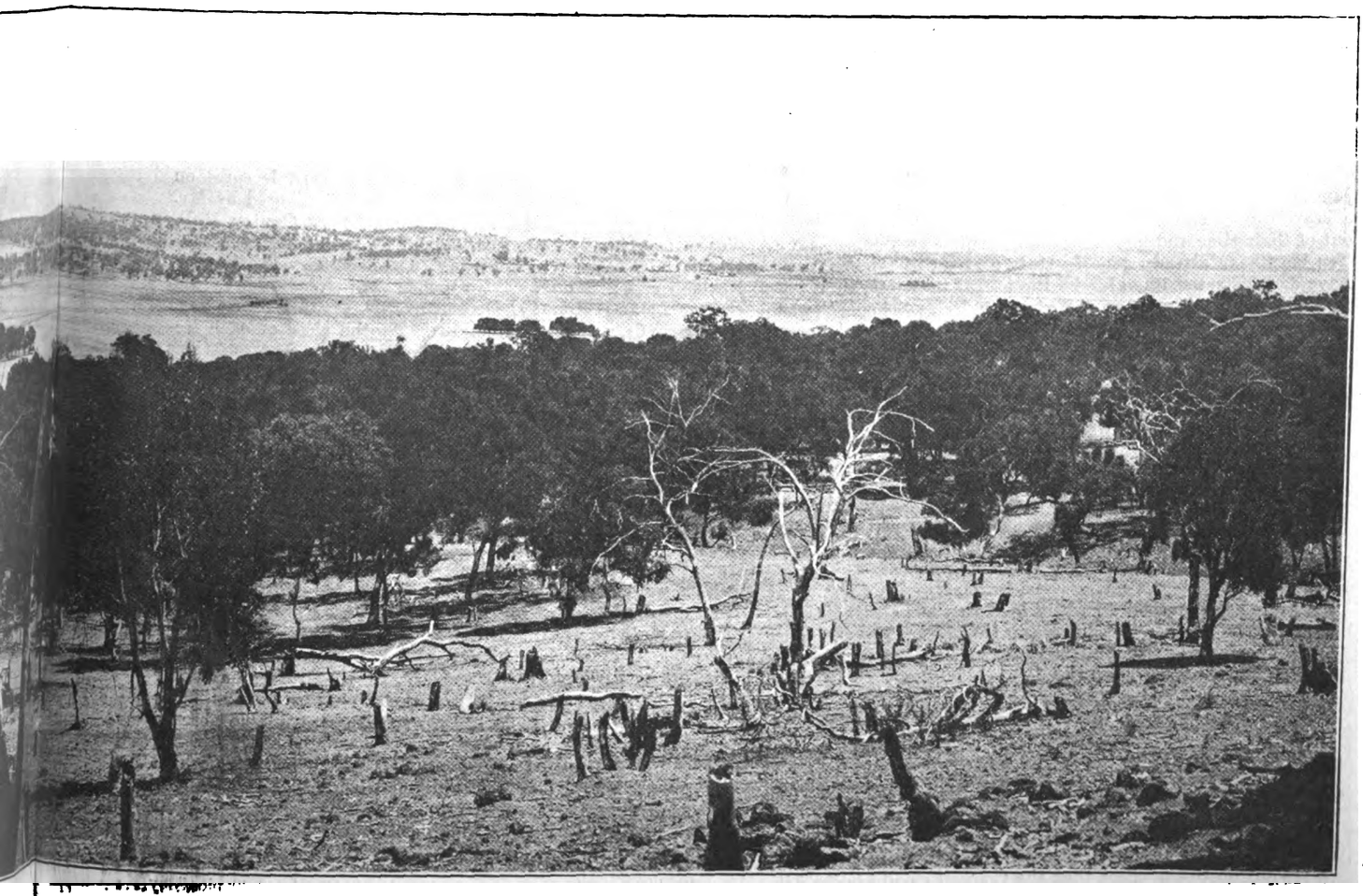




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THE CAPITAL CITY OF AUSTRALIA.

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NATIONAL ASSOCIATION OF MASTER HOUSE PAINTERS.

The seventeenth annual convention of the National Association of Master House Painters and Decorators of England and Wales opened in Newcastle-on-Tyne on October 4, and will remain open till October 8.

The National Association was founded in Manchester in 1894. Its objects are to protect and promote the interests of the painters and decorators. Various practices had crept into the supply of materials and wall-papers, and there was no common organisation to unite the interests under one authority.

The meeting was first called on the initiation of the present secretary, and a fund was formed locally to cover any expenses. Decorators from all parts of England and a large contingent from Scotland met in the Memorial Hall in October 1894, and passed certain resolutions organising a National Association for England and Wales. Scotland was already possessed of such an association.

The first president was Mr. George Gavin Laidler, of Newcastle, and the Association was fortunate in its choice. An influential committee was organised to draft rules and by-laws, which were adopted and constituted at the next annual meeting, under the presidency of Mr. Laidler, held in Newcastle in 1895.

With this convention Newcastle will have received the National three times. The second occasion was in 1902, when Mr. John Graham Cole was President, and now, under the presidency of Mr. John Brown. The association has visited Birmingham, Manchester, Liverpool, and Sheffield twice, and Blackpool, Leicester, Nottingham, Hereford, Leeds, and Plymouth once. Its membership consists of direct personal members and local associations affiliated to it.

In 1901 the Association was incorporated by license of the Board of Trade. Its energies are directed to the service of its members and to the education of the young men engaged in the trade.

An agency is established in Manchester for insuring the members against the risk of the Workmen's Compensation Act through one of the large and stable insurance companies, and this has proved of great utility to the members, their claims being met promptly and a certain rebate made to them off the standard rates. Questions affecting the supply of wall hangings have been adjusted satisfactorily to the members, and the Association has proved its usefulness in this and other directions on many occasions.

The educational work of the Association has been of the greatest importance to the trade. A carefully graded system, commencing with boys in the first and second years of their apprenticeship, has been designed and covers the whole period of apprenticeship. In addition the Association has, in conjunction with the Scottish and Irish Associations, established a Travelling Scholarship of the value of 50*l.* annually for boys out of their time and not more than twenty-two years of age. Ten boys have already gone to Italy under this scheme, and have demonstrated its value by the useful positions they are now filling. Last year an "Extension Prize Scheme" was established to stimulate study in young men between the ages of twenty-two and twenty-five, and the experiment quite justified itself, as some excellent work was sent in.

A painting school devoted to training in the decorative art was established in Manchester, and was run for three years. It did excellent work while it was open, but the expenses of maintenance of the boys who came from a distance handicapped it, and it was reluctantly abandoned.

Altogether the Association has spent nearly 3,000*l.* in furthering the work of education, and has devoted the greater part of the profits arising from the exhibitions held in connection with its annual meetings to this purpose.

The Association is giving consideration to the question of the use of alternatives to white lead in the painting trade, and experiments are being made to that end. The incidence of lead poisoning is proving so disastrous that it is necessary some steps should be taken to mitigate its effects.

The Surrey County Council have given formal notice of their intention (*a*) to provide a new school for about 200 children at Cobham; and (*b*) to enlarge St. John's Council School, Woking, by 200 places.

Newburn Urban District Council on the 5th inst. carried a resolution to the effect that the Council should build fifty-eight dwellings for the working classes at Walbottle. The subject is to come up for further discussion.

THE SOCIETY OF ENGINEERS.*

In his opening remarks the author referred to the fact that the status of the engineering profession had recently received considerable attention. He thought that the chief need is to prevent unqualified men from pretending that they are members of the profession, as by so doing they lower its prestige in the eyes of the general public.

In dealing with applications for election to professional societies, the author recommended that candidates should be personally cross-examined by local advisory committees as to their fitness. Members should be elected to the Council for a period of only one year at first, but if elected for three years in succession should then become permanent councillors, and rise by seniority to the position of vice-president and president.

To be a competent engineer a man must possess a judicious mixture of theoretical and practical knowledge. The mere fact of passing an examination does not indicate that a man has all the theoretical and practical knowledge he needs. A college course must, at least as regards civil engineering, be considered solely as an education in theoretical principles. Training of pupils should consist of education in theoretical principles and the employment of theoretical knowledge in practical work. Many present-day pupils are being charged first with theory and then with practice without at all understanding the dependency of one upon the other.

Engineers often complain that they cannot find competent assistants, and, on the other hand, many assistants bewail the very low remuneration obtainable. Men may be divided into two classes—workers and administrators. So long as a man remains a worker his remuneration is not likely to exceed 300*l.* per annum. Mere professional skill in an assistant will rarely enable him to rise above the rank of a worker. A man who is a comparatively poor engineer but a first-class business man will probably succeed better than the highly qualified engineer with a soul above commercial considerations.

The author suggested the establishment of a central bureau where a register of the career of every engineer should be kept open to public inspection. Instead of applying for appointments as at present, a candidate would ask for a certified copy of his page in the register to be forwarded to a prospective employer. In the same way, before engaging an engineer an employer would obtain a copy of his record.

Examinations to prove the competency of men to carry out certain duties should be as practical as possible, but candidates should show that they possess theoretical knowledge and know how to use it.

The Council of the Society of Engineers (Incorporated) in conjunction with the Council of the Junior Institution of Engineers, have arranged for a course of six lectures on "The Law relating to Engineering," to be delivered by Mr. L. W. J. Costello, M.A., LL.B. (Cantab), at Caxton Hall, Westminster, at 7.30 P.M., on the following dates:—Monday, October 10; Tuesday, October 25; Wednesday, November 9; Monday, November 21; Wednesday, December 7; and Monday, December 19. Fee for the course: Members, 6*s.*; non-members, 12*s.* At the close of each lecture opportunity will be given for the asking of questions and for discussion. Applications for tickets should be made to the Secretary of the Society of Engineers at 17 Victoria Street, Westminster; or to the Secretary of the Junior Institution of Engineers, 39 Victoria Street, Westminster.

On Wednesday, September 21, a party of members of the Society and their friends (including a number of ladies) visited the Naval, Mercantile Marine and General Engineering and Machinery Exhibition at Olympia, by invitation of the management. Some time was spent in examining the exhibits and witnessing various demonstrations which were being given and in which considerable interest was displayed, after which the visitors were received in the Pillar Hall by Sir David Gill. Tea was then served, at the conclusion of which a hearty welcome was extended to the visitors by Sir David Gill and Mr. F. W. Bridges on behalf of the managing body of the Exhibition.

Mr. E. J. Silcock, M.I.C.E., in the unavoidable absence of the President, expressed the Society's thanks for the invitation extended to them and for the hospitality which they had received. It was a great pleasure to all of them to have the opportunity of seeing the many matters of interest which were comprised in the Exhibition.

A further inspection of exhibits afterwards took place.

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* Abstract of a paper on "Current Professional Topics," by Henry C. Adams, Assoc.-M.Inst.C.E., A.M.I.Mech.E., A.M.I.E.E., &c. (Fellow).

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THE HOUSING, TOWN PLANNING, ETC., ACT, 1909, FROM THE SANITARY INSPECTORS' POINT OF VIEW.*

(Concluded from September 23.)

Doubtless many of you will be able to supplement these examples by others you have met with, and I will, therefore, only refer in detail to two of them:—(1) A house with no pantry accommodation. Suppose such a house is in all other respects reasonably satisfactory, is it unreasonable to require that the tenants should have some suitable place in which food may be stored, so that, for instance, the baby's milk-jug may not have to be left standing in some dark, unventilated cupboard, perhaps keeping company with the gas-meter and a few household utensils in a dark hole under the stairs, or "lying about" in the living-room? Personally, I am of opinion that any house without a proper pantry is not "in all respects reasonably fit for human habitation," and I am convinced that if we could remedy such a condition by proceedings under the sections I am dealing with we should have the means at our disposal for eradicating one of the most important contributory causes of our present high infantile mortality. (2) Houses unprovided with proper bedroom accommodation. In these cases I have in mind the conditions which exist in several of our mining villages in the North. A cottage consisting of a large living-room, with an attic above, and occupied, say, by father, mother, and a grown-up son and daughter. The ground-floor room is of necessity used as a bedroom owing to the lack of other bedroom accommodation, and yet the cubical capacity per head may be sufficient, and so make proceedings under the nuisances clauses nugatory. In thousands of cases the only room other than the living-room is the attic above mentioned, the approach to it being by means of a trap ladder, and as in addition no fireplace is provided, its use in cases of illness is out of the question. Instances of these conditions may be met with in nearly all our Northern colliery districts, and in many cases the houses may be reasonably fit for human habitation in all respects save one, *i.e.*, absence of suitable bedroom accommodation. Many of the houses alluded to could not be satisfactorily dealt with under previous Housing Acts nor under the Public Health Acts, as under ordinary conditions the house may be quite suitable—with a little inconvenience no doubt—to meet the requirements of the family, but should there be a case of sickness in the house the living-room has to be requisitioned, as it is the only room with a fireplace and suitable means of ingress or egress. We have then a room utilised as a sick-chamber in which the household cleaning, washing, and baking is carried on, and where the rest of the family have to partake of their meals. Surely a house that has not at least one good bedroom furnished with proper means of lighting and ventilation, and also a fireplace, cannot be regarded as "in all respects reasonably fit for human habitation."

Another new feature which may appropriately be dealt with under my third heading is found in Section 16. A difficulty has frequently presented itself in dealing with certain structural defects in houses let in lodgings where the defects referred to were contraventions of the by-laws. Previously, the person against whom action had to be taken in such cases was the keeper, as the owner could not be held to be responsible for any contravention, structural or otherwise, unless the latter exercised control over its management, either in person or by means of an agent. As the keeper and owner were generally two different persons, it was often a most unfair proceeding to call upon the keeper to carry out structural alterations, even where contravention of the by-laws demanded the necessity for such work.

Under Section 16 (1), the power of making by-laws for houses let in lodgings is extended in the cases of houses intended for the working classes, and the by-laws may now impose the performance of any duty demanding the execution of work upon the owner, either in addition to or in substitution of any other person. It is further provided by subsection (3) that where the owner or other person has failed to execute any work required under the by-laws, the local authority, after twenty-one days' notice, may themselves do the work and recover the costs and expenses.

IV. *Other Provisions of General Interest to the Sanitary Inspector.*—(a) Prohibition of back-to-back houses. The perpetuation of this type of dwelling-house is now prevented under the provisions of Section 43, which makes it unlawful "to erect any back-to-back houses intended to be used as dwellings for the working classes, and any such houses commenced to be erected after the passing of this Act shall be deemed to be unfit for human habitation." There are two provisos to this section under which (1) the prohibition alluded to does not apply in the case of tenement houses if the medical officer of health of the district certifies that the several tenements are so constructed and arranged as to secure the effective ventilation of all habitable rooms; and (2) the retrospective operations of the Act are prevented.

This section has met with a storm of disapproval in some districts, particularly in those where the building of back-to-back houses has been most common in later years. This disapproval is readily understood by anyone who has had experience of the type of back-to-back houses provided in some of the towns in the West Riding of Yorkshire. Many of these are comparatively most admirable structures and far superior from a health point of view to houses of the "through" type, provided in districts where modern building by-laws are unknown, and where the supervision of new buildings is so slight that the speculative builder or the colliery proprietor can do as he likes. But this fact must not be forgotten, that so long as the building of back-to-back houses was not absolutely prohibited, these structures would have been erected from time to time, not only in the districts where public health requirements were most rigorously enforced and where the back-to-back condition was the only one to which exception could be taken, but also in the "no bye-law" districts, where the back-to-back condition in new houses would probably be accompanied by the lack of many other conditions which modern sanitation demands. This being the case, the prohibition referred to will be gladly welcomed by all broad-minded sanitarians, and must be regarded as a step forward in the cause of public health.

(*b*) Underground sleeping-rooms.—By reason of the provisions of Section 17, which came into force on July 1 of this year, new powers are now available for dealing with underground rooms used as sleeping-rooms. A room, habitually used as a sleeping-place, the surface of the floor of which is more than three feet below the surface of the adjoining street, is to be deemed a dwelling-house unfit for human habitation if it is not at least seven feet in height, and does not comply with regulations which a local authority may make for securing proper ventilation, lighting, protection against dampness, effluvia, &c.

The Local Government Board recommend that local authorities, in whose district rooms are situate which come within the terms mentioned, should make an early opportunity of framing regulations, and the Board are given the necessary powers to insist on this being done.

(*c*) Power of the Local Government Board to enforce systematic inspection and to make regulations relating thereto. This is undoubtedly of more than passing interest to the sanitary inspector, and any action taken by the Board to secure the carrying out of these provisions will affect the sanitary inspector more than any other officer of the local authority. Section 17 (1) re-enacts the existing law which required every local authority to have their district periodically inspected in order to ascertain whether any house therein was in such a state as to be unfit for human habitation. This, of course, could only be properly accomplished by systematic house-to-house inspection, and, as the Board point out in their circular dealing with the Act, there can be no doubt that in some districts the inspection referred to has not in the past been adequately carried out. But the new provisions relating to this matter go much further, not only are additional duties placed on the shoulders of the local authorities—duties which are bound, because of their nature, to be handed over to the sanitary inspector—but adequate measures are provided for enforcing their carrying out. The latter part of the sub-section states "it shall be the duty of the local authority and of every officer to comply with such regulations and to keep such records as may be prescribed by the Board." Further, the Board have power, under Section 11, to make an order requiring any authority who have failed to carry out these duties to remedy their default, and any order so made may be enforced by mandamus. The Board attach much importance to these new provisions.

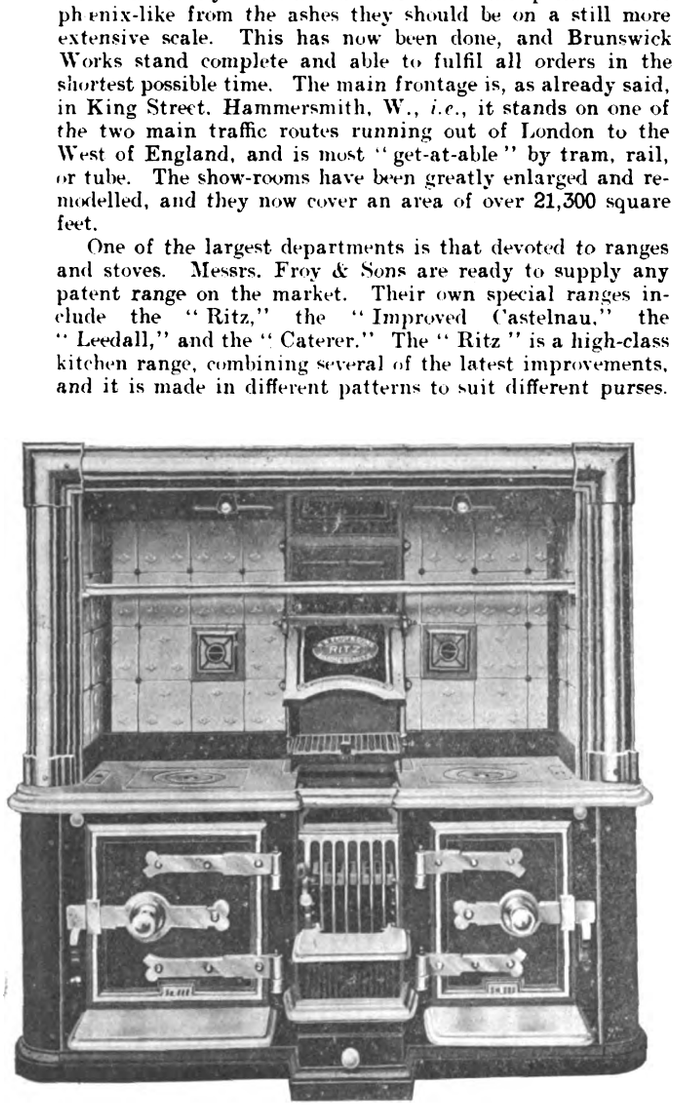
* Abstract of a paper read before the Sanitary Inspectors' Association by Mr. Walter Smith, Sanitary Inspector, Northumberland County Council, on August 31, at their twenty-fifth annual conference held in Fishmongers' Hall, London Bridge, E.C.

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MESSRS. FROY'S RECONSTRUCTED SHOWROOMS.

In June of last year Messrs. W. N. Froy & Sons, Ltd., builders' merchants and manufacturers, were the unfortunate victims of a serious fire which raged for several hours in their premises fronting on King Street, Hammersmith, W. In referring to the affair we alluded to the pluck shown by the firm in endeavouring to continue their business in such a way as to prevent their customers suffering any inconvenience. Fortunately portions of the extensive Brunswick Works, including their newly built show-rooms, escaped undamaged. The firm boldly determined that when the premises rose phœnix-like from the ashes they should be on a still more extensive scale. This has now been done, and Brunswick Works stand complete and able to fulfil all orders in the shortest possible time. The main frontage is, as already said, in King Street, Hammersmith, W., *i.e.*, it stands on one of the two main traffic routes running out of London to the West of England, and is most "get-at-able" by tram, rail, or tube. The show-rooms have been greatly enlarged and remodelled, and they now cover an area of over 21,300 square feet.

One of the largest departments is that devoted to ranges and stoves. Messrs. Froy & Sons are ready to supply any patent range on the market. Their own special ranges include the "Ritz," the "Improved Castelnau," the "Leedall," and the "Caterer." The "Ritz" is a high-class kitchen range, combining several of the latest improvements, and it is made in different patterns to suit different purses.



The "Improved Castelnau" is offered as an excellent medium-class kitchener, which contains many improvements on the firm's well-known "Castelnau Range." Particular attention has been paid to the size of fire space so as to ensure as much economy in fuel consumption as is possible without any sacrifice of efficiency; this is further aimed at by a slow combustion ashes pan. A still cheaper line of ranges is sold under the designation the "Leedall," they have been described as the best low-priced ranges on the market.

Another extensive department is given up to mantel suites, stoves, and interiors. A wide choice is offered in the matter of tile surrounds and similar details. Messrs. Froy & Sons likewise show a stock of kerb-suites, fenders, screens, coal-boxes, and other furniture. No builders' merchant is without a sanitary show-room; that at the Brunswick Works is an important part of the business.

Attention may be drawn in conclusion to the leaded glass works, where much excellent work is carried out. The panels in the leaded windows are glazed with patent steel lead, or steel supports encased in lead. This gives additional strength, and removes the necessity of saddle bars. Messrs. W. N. Froy & Sons, Ltd., are ready to send experienced workmen to take the necessary preliminary measurements, and also to fix the windows. Architects' designs or suggestions will be faithfully carried out, or Messrs. Froy & Sons are prepared at all times to submit designs to special requirements free of charge.

VARIETIES.

The Salvation Army being about to repair the ruins of Hadleigh Castle, near Southend, have asked the Society for the Preservation of Ancient Buildings to advise them.

Perth Town Council has declined to adopt a recommendation to introduce electric stoking machinery for charging the retorts at the gasworks at a cost of 4,000*l.*

Mr. Horace Don, M.S.A., 62 Moorgate Street, E.C., has prepared plans for the erection of an electric theatre in Broadstairs by a company that is in process of formation.

Messrs. Henry Adams & Son have been called in by the Holme Cultram U.D.C. to examine and report upon the sea-wall at Silloth, which is showing signs of failure.

Mr. F. J. Hodgson, architect, High Street, Guildford, has prepared plans for the erection of a winter palace and rink in Farnham Road, Guildford, at a cost of about 2,500*l.*

A sub-committee in Newcastle have decided that the city's memorial to the late King should take the form of a monument in Eldon Square to cost about 5,000*l.*

Messrs. Frank Matcham & Co. are the architects preparing designs for the five music-halls which are to be erected in London by Mr. Oswald Stoll on the north side of the Thames at a cost of 250,000*l.*

H.M. Legation in Mexico report that the use of steel girders for structural purposes has greatly increased of late in that country on account of their resistance to earthquake shocks.

A Local Government Board inquiry was opened last week into Surbiton's 63,500*l.* sewerage scheme. There was considerable opposition, principally from the Corporation of Kingston, through whose area it is proposed to run a sewer and effluent drain for a short distance.

Mr. Otto Beit has promised a gift of 5,000*l.* to complete the amount needed for the erection of the Children's Sanatorium (consumptive children) at Holt, Norfolk, and the committee will be able to proceed with the building without further delay.

Mr. Henderson, C.E., Edinburgh, has prepared a report and plan for the extension of Anstruther Harbour, N.B., to allow the Harbour Commissioners to make application for a grant from the Development Commissioners. The estimated cost of the improvements is 30,163*l.*

The Birmingham education committee have agreed to proceed at once with the complete scheme for the erection of a school for 1,000 children on a site in Sladefield Road, instead of one for 650 children; that the proposed site for a playing field in Belcher's Lane, Bordesley Green, be purchased at the rate of 200*l.* per acre; and that the site in Bristol Street near the Bristol Passage be purchased for the purposes of a special school for 150 defective children.

The Northumberland education committee have agreed that plans be approved and submitted to the Board of Education for two new schools, one at Ashington, New Hirst East, with accommodation for 1,140 scholars, and estimated to cost 12,600*l.*, and the other at Bedlington Station, for 568 scholars, and estimated to cost 6,450*l.* It was also agreed that the proposed Council school at Stakeford be built on a site of 1¼ acres, situated about 36 feet to the north of the institute.

The *Gaceta Oficial*, Cuba, contains a notice, issued by the Secretaría de Agricultura, Comercio y Trabajo, relative to the erection of 2,000 workmen's dwellings in various parts of the Republic. The project includes 1,000 houses in Havana, 90 in Matanzas, 100 in Camagüey, and 120 in Santiago de Cuba. Work is expected to be begun shortly, and a period of two years is allowed for the erection of the 1,000 dwellings in Havana.

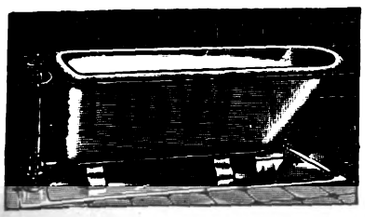
Hitherto a patent in Norway has been annulled if the article was not manufactured there. The Norwegian Government now recognises that it is unjust to so deprive an inventor of his rights, and they have now substituted for the old regulation a *licence obligatoire*. By the new law the inventor retains his rights; but should he not produce the article himself the rights of manufacture can be conceded if he so desires. This law will come into force from January 1, 1911.

The new penal code of Siam contains special provision relative to the protection of trade marks. By article 236 anyone counterfeiting a trade-mark, a designation, or a name of a firm employed as a trade-mark, is liable to imprisonment from three months to three years, and a fine of from 100 to 5,000 ticals (a tical is worth about 1*s.* 4*d.*). Article 237 says:—Anyone who, without infringing a trade mark, imitates it in a way calculated to deceive purchasers, will be punished by imprisonment from one month to a year, and a fine of from 50 to 2,000 ticals. Further information may be obtained from J. Gevers & Co., L'Agence de Marques de Fabrique, Anvers.

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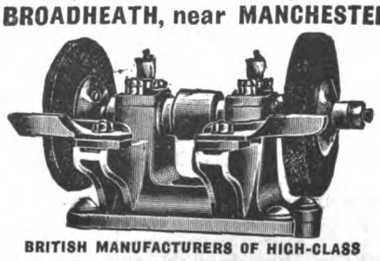
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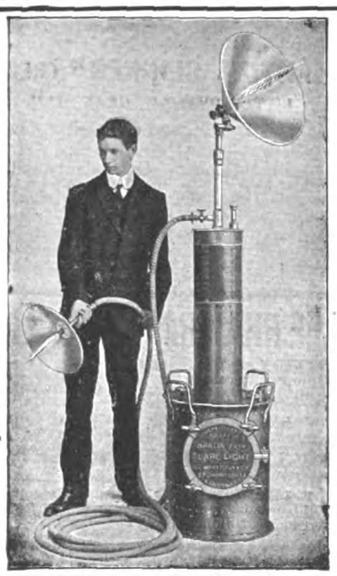


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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

Bournemouth.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

Ireland.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

Ireland.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

Manchester.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

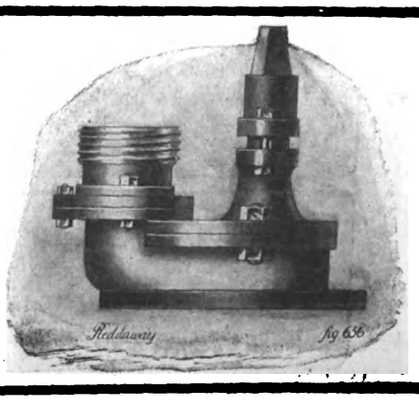
Romford.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached



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cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

Ruislip.—Nov. 15.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

Tingley.—Oct. 29.—The committee of the Tingley Working Men's Club and Institute, Tingley, West Ardsley, offer a prize of 5*l.* 5*s.* for the best accepted design for their new club premises, the plans to be for a club suitable for accommodating 300 members. Mr. Jno. Hawthorn, secretary, Booth's Buildings, Tingley, near Wakefield.

CONTRACTS OPEN.

Bacup and Rawtenstall.—Oct. 26.—For erection of secondary and technical school at Waterfoot. Plans and particulars on payment of 2*l.*, returnable. County Architect, Mr. Henry Littler, 16 Ribblesdale Place, Preston.

Baremuir (Buckie).—Oct. 24.—For the erection of a cottage hospital, for Rathven Parish Council. Mr. John W. Gordon, parish clerk, Buckie.

Berwick-on-Tweed.—Oct. 20.—For alterations and improvements on farm house, farm offices and cottages, at the farm of New Mills, Corporation property. Messrs. J. Stevenson & Son, architects, 14 North Terrace, Berwick-on-Tweed.

Beswick.—Oct. 29.—For the erection of the Gibbon Street Municipal school, Beswick, and Clarendon Road Municipal infant school, and alterations and additions to existing school, Crumpsall, for the Manchester Education Committee. Deposit 2*l.* 2*s.* Mr. Thomas Hudson, town clerk.

Bingley.—Oct. 24.—For new block at New Training College. Architect, County Hall, Wakefield.

Brecon.—For the erection of four new class-rooms (200 places), master and mistress room, cookery kitchen, and alterations to existing buildings at Mount Street school, and three new class-rooms (128 places), new cloak-rooms, &c., and alterations to existing building at Llanfaes school, Brecon. Mr. Charles W. Best, surveyor, Breconshire Education Committee, County Hall, Brecon.

Bridlington.—Oct. 17.—For the erection of two semi-detached dwelling-houses on the Belvedere Estate. Mr. Joseph Shepherdson, architect, 8 Quay Road, Bridlington.

Buckie (Scotland).—For the various works required in the erection of several villas in Buckie. Messrs. Sutherland & George, architects, Aberdeen.

Cannock.—Oct. 25.—For alterations and additions to the Council offices, Cannock. Messrs. Hickton & Farmer, architects, Bridge Street, Walsall. Bills of quantities supplied. Deposit 1*l.* 1*s.* Mr. C. A. Loxton, clerk to the Council, Council Offices, Cannock.

Chester.—Oct. 17.—For a new annexe for 440 patients at the Upton Asylum. Deposit 3*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Constantine.—Oct. 22.—For additions and alterations to house at Constantine. Mr. H. E. Tresidder, architect, 23 Church Street, Falmouth.

Cork.—Oct. 31.—For rebuilding the bank premises, South Mall, Cork, for the directors of the Munster and Leinster Bank. Mr. Arthur Hill, architect, 22 George's Street, Cork.

Deptford.—Oct. 18.—For (1) construction of flooring over first-class swimming-bath at Laurie Grove, New Cross; (2) alterations to building. Deposit 1*l.* 1*s.* Mr. J. Sutcliffe, A.M.Inst.C.E., borough surveyor, Town Hall, New Cross Road, S.E.

Derby.—Oct. 19.—For the erection of petroleum and oil stores at Derby, for the directors of the Midland Railway Co. Engineer's Office, Derby Station. Mr. Alexis L. Charles, secretary.

Doncaster.—For the erection of new stores, consisting of three shops and manager's house, at Carcroft, for the Doncaster Mutual Co-operative and Industrial Society, Ltd. Mr. P. Brundell, architect, Princes Street, Doncaster.

Durham.—Oct. 18.—For erection of the following works for Durham education committee:—(1) Erection of schools at Benfieldside (for about 300 children), Hetton-le-Hole (for about 750 children), and Ushaw Moor alterations and additions, Mr. W. Rushworth, Shire Hall, Durham; (2) erection of Norton cookery centre, Mr. N. Richley, Shire Hall, Durham.

East Ham.—Oct. 18.—For erection of a playshed at Walton Road Council school. Mr. R. L. Curtis, architect to the committee, 11 and 12 Finsbury Square, E.C.

Eastbrook (Dinas Powis).—For block of four cottages at Eastbrook, Dinas Powis. Deposit 1*l.* Mr. T. Edgar Smith, architect and surveyor, 29 St. Mary Street, Cardiff.

Edinburgh.—Oct. 17.—For the erection of ladies' lavatory and shelter, Ardmillan Terrace. Mr. T. Hunter, town clerk, City Chambers, Edinburgh.

Elgin.—Oct. 20.—For the reconstruction of dwelling-house and building of new bothy at Kinloss Farm. Mr. Charles C. Doig, architect, Elgin.

Fleur-de-Lis (Mon.).—Oct. 18.—For the erection of a new infants' school at Fleur-de-Lis (Mon.), to accommodate 250 infants, together with a centre for the teaching of domestic arts. Deposit 1*l.* 1*s.* Mr. John Bain, architect, Council Offices, Newport.

Glasgow.—Oct. 19.—For erection of the superstructure of the labour and telephone exchange, College Street, for the Commissioners of H.M. Works and Public Buildings. Mr. Kennedy, clerk of works, General Post Office, Hanover Street, Glasgow. Send 1*l.* 1*s.* deposit to H.M. Office of Works, 3 Parliament Square, Edinburgh.

Grendon.—Oct. 31.—For the erection of an isolation hospital at Grendon, within the district of Atherstone, for the Atherstone Rural District Council. Deposit 2*l.* 2*s.* Mr. H. J. Coleby, engineer and surveyor, 102 Long Street, Atherstone.

Hanley.—For erection of workshops and warehouses. Messrs. E. L. Maddock & Sons, architects, Hanley.

Handsworth.—Oct. 21.—The West Riding Education Committee invite whole or separate tenders for the following works:—Handsworth, Intake new infants' school (builder, joiner, slater, plumber, plasterer, and painter). Send 1*l.* deposit to the West Riding Treasurer, Wakefield. The Education Architect, County Hall, Wakefield.

Heswall (Cheshire).—Oct. 21.—For erection of new county police station at Heswall, for the County Council. Deposit 1*l.* Mr. H. Beswick, county architect, Chester.

Hunslet.—Oct. 20.—For work required in the erection of boundary walls, palisading and formation of playground at the Cockburn High School, Hunslet, for the Leeds Education Committee. Education Department (Architect's Section), Calverley Street, Leeds.

Hunwick (Durham).—Oct. 15.—For six houses to be built at Hunwick Lane Ends. Messrs. R. & J. H. Thompson, Constantine Farm, Hunwick.

Kilkenny.—Oct. 20.—For erection of a sanitary annexe at the fever hospital of the Kilkenny Union, also the erection of baths and lavatories in the infirm men's apartments of the workhouse. Mr. K. Comerford, clerk of Union.

Kinsale.—Oct. 18.—For erection of thirty-nine cottages, in accordance with plans and specifications to be seen at the Council Office, for the Rural District Council. Deposit 2*l.* per cottage. Mr. Edward Murphy, acting clerk of the Council, Council Office, Kinsale Workhouse.

Leigh-on-Sea.—Oct. 17.—For repairs at The Elms and Algonquin, Salisbury Road, Leigh-on-Sea. Mr. Frederic Gregson, clerk, 46 Alexandra Street, Southend-on-Sea.

Leiston (Suffolk).—Nov. 14.—For the erection of new elementary school at Leiston, and for alteration and enlargement of the Eye Grammar School, for the East Suffolk County Education Committee. Deposit 2*l.* 2*s.* Mr. W. E. Watkins, secretary, Education Office.

Manchester.—Oct. 30.—For the erection of new Labour Exchange, Manchester, for the Commissioners of H.M. Office of Works, &c., Storey's Gate, S.W.

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Margate.—Oct. 17.—For erection of a dust destructor. Mr. E. A. Borg, borough surveyor, 13 Grosvenor Place, Margate.

Midsomer Norton.—Oct. 17.—For the erection of a higher elementary school at Norton Hill. Mr. William F. Bird, M.S.A., Midsomer Norton, Somerset.

Milford Haven.—Oct. 27.—For the erection of new buildings, and alterations to the existing buildings at the Council school, Milford Haven. Deposit 1*l.* 1*s.* Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest. Mr. Wm. Davies George, clerk to the Education Committee, County Education Offices, Haverfordwest.

Monk Bretton (Yorks.).—Oct. 19.—For repairs, &c., to be carried out at Monk Bretton, Smithies Council school, for the Royston District Sub-Committee of the West Riding County Council. Mr. T. Graham, West Riding Education Offices, Obelisk Chambers, Barnsley.

Monkwearmouth (Durham).—Oct. 25.—For extension of goods warehouse and provision of new offices at Monkwearmouth, for the directors of the North Eastern Railway Company. Mr. R. F. Dunnell, secretary, York.

Pennybridge.—Oct. 20.—For the erection of a house at Pennybridge. Mr. Henry T. Fowler, architect and surveyor, 6 Cornwallis Street, Barrow-in-Furness.

Pentre (Rhondda).—Oct. 21.—For (1) erection of a new school at Gelli, to be known as Bronllwyn school, to accommodate 400 mixed and 400 infant scholars; (2) extensions at Williamstown infants' school, for the Rhondda Urban District Council. Deposit 2*l.* 2*s.* Chairman of Building Committee, Council Offices, Pentre.

Salisbury.—Oct. 19.—For building new sanitary blocks to the infirmary, bath-rooms to the able-bodied men's and women's wards, and alterations to the latrines, for the Guardians. Messrs. John Harding & Son, architects, 53 High Street, Salisbury.

Treforest.—Oct. 29.—For the erection of twelve or more semi-detached villas at Forest Estate, Treforest, for the Forest Building Club. Messrs. Gibson, Parry Williams & Co., architects, Pontypridd.

Treherbert.—Oct. 24.—For the rebuilding of Soar Baptist Chapel, Treherbert. Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy.

Wakefield.—Oct. 21.—The West Riding Education Committee invite whole or separate tenders for the following works:—Wales Council school, alteration and additions (builder, joiner, slater, plumber, plasterer, painter, heating engineer). Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield. The Education Architect, Wakefield.

Wales.—Oct. 16.—For the erection of twenty houses off Brompton Terrace, Tredegar, for the Vale View Building Club. Mr. A. F. Webb, architect and surveyor, High Street, Blackwood.

Wales.—Oct. 17.—For erection of villa at Pentre. Mr. W. D. Morgan, M.S.A., 194 Ystrad Road, Pentre.

Wales.—Oct. 17.—For carrying out certain alterations, repairs, papering and painting, &c.:—(a) The Commercial Inn, Talywain; (b) the Montague Hotel, Pontypool, for Messrs. A. Buchan & Co., Rhymney. Mr. Thomas Roderick, architect, Aberdare.

Wales.—Oct. 18.—For the erection of a police station at Ynysddu. Mr. William Tanner, F.S.I., county surveyor.

Wales.—Oct. 19.—For erection of a chapel at Caersws. Deposit 1*l.* 1*s.* Mr. R. W. Davies, M.S.A., architect, &c., Dolafon, Carno.

Withington.—Oct. 31.—For the erection of baths at Burton Road, Withington, for the Manchester Corporation. Deposit 3*l.* 3*s.* City Architect, Town Hall.

Mr. Alfred Hill Parker, of Worcester, architect and surveyor, has been reappointed, for a period of five years, diocesan surveyor under the Ecclesiastical Dilapidations Act for that part of the diocese of Worcester which is not within the county of Warwick.

The West Hartlepool Town Council last week agreed to enter into an agreement with the Seaton Carew Iron Co., by which the Corporation would be allowed to utilise the waste heat from that company's furnaces for the generation of electricity. A new generating station will be erected near the Seaton Carew Ironworks, and the present generating station used merely as a stand-by. The latest and most economical system of generating electric current on the turbo system will be adopted. The cost will be about 20,000*l.*

TENDERS.

ABERDEEN.

For works in connection with extension of tramway shed at Queen's Cross, for the Tramways Committee.

Beattie & Son, mason	£798 18 0
Wishart, carpenter	339 10 0
Moir, plasterer	109 7 0
Booth, glazier	103 12 8
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ANERLEY.

For enlargement of the town hall, for the Penge Urban District Council.

Peddle	£4,914 17 5
Heathfield	3,993 0 0
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Spencer, Santo & Co.	3,643 0 0
Nightingale	3,590 0 0
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Honour	3,520 0 0
Appleby & Sons	3,520 0 0
Fitch & Cox, Enfield (*accepted*)	3,497 0 0

BYFLEET.

For carrying out the sewerage and sewage disposal works, for the Chertsey Rural District Council. Messrs. Elliott & Brown, A.M.M.I.C.E., engineers, Nottingham.

Kavanagh & Co.	£32,756 0 0
D. R. Paterson, Ltd.	31,392 10 0
J. & T. Binns	30,880 9 3
Osenton	30,846 0 0
Muirhead & Co.	29,999 0 0
W. J. Jackson	29,498 0 0
Moss	25,990 0 0
Lane Bros.	24,903 15 0
Wilson & Co.	24,842 11 0
Braithwaite & Co.	24,781 7 10
D. T. Jackson	24,490 0 0
Cockerell	24,000 0 0
Price & Co.	23,110 11 7
Hardy & Co., Woking (*accepted*)	22,922 0 0

CARLISLE.

For the erection of the engineer's house for the Board of Guardians.

Accepted tenders.

Hill, builder	£166 10 3
Martin, joiner	86 16 8
Kellet, slater	16 10 0
Batey, plumber	17 17 3
Ferguson & Sons, plasterer	19 3 6
Kirk, painter and glazier	12 5 6

CHATHAM.

For erection of a receiving ward and two pairs of cottages at the Cottage Homes. Mr. G. E. Bond, architect, Rochester.

	Cottage Homes.	Receiving Ward.
Richards	£6,840	£4,769
J. & M. Patrick	5,072	3,824
Wilford	5,050	3,875
Baker & Son	4,739	3,579
Phillips, H. A.	4,595	3,749
Gates	4,470	3,495
Seagar	4,399	3,399
West Bros.	4,359	3,368
Webb	4,270	3,152
Phillips, H. E.	4,194	3,354
Skinner, Chatham (*accepted*)	4,110	3,075

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FRITHVILLE.

For alterations to the Council school, for Lindsey County Council education committee. Messrs Scorer & Gamble, architects, Lincoln.

Emerson Bros.	£793 10 0
Hensman & Sons	723 0 0
Parker & Son	650 0 0
Scarborough	594 0 0
Hollingsworth Bros.	591 12 4
Pett & Bonfield	589 0 0
Barber	588 0 0
Peck	583 0 0
Leafe & Sons	570 0 0
Sargeant & Sons	563 12 0
Miller & Son	549 15 0
Belton & Co.	547 10 0
Darby	525 0 0
Allen Bros., Boston	512 9 10

HENDON.

For paving works, &c., at Hoop Lane and Temple Fortune Lane, for the Urban District Council. Mr. S. S. Grimley, A.M.I.C.E., engineer and surveyor.

Hoop Lane.—Paving, &c.

Wellerman Bros.	£525 5 6
Griffiths & Co.	502 15 0
J. & T. Binns	500 5 0
Paterson	500 9 3
Hamiltons	495 15 0
Dickson	489 10 10
Ballard	483 5 0
Wimpey & Co.	481 11 11
Powdrill	435 18 6
Brummell	435 16 2
Moss & Son	435 14 5
Edwards & Co.	435 0 0
Watson, jun. (*accepted*)	427 4 9
Muirhead & Co.	410 15 2
Engineer's estimate (including paving £165)	667 17 4

Temple Fortune Lane.—Paving and surface water drain.

Griffiths & Co.	£1,639 15 0
Wellerman Bros.	1,574 14 3
Paterson	1,568 19 0
Ballard	1,568 18 0
J. & T. Binns	1,557 9 6
Wimpey & Co.	1,505 18 3
Moss & Son	1,470 19 4
Hamiltons	1,466 5 8
Edwards & Co.	1,416 19 10
Brummell	1,411 3 10
Dickson	1,381 3 0
Powdrill	1,340 17 7
Muirhead & Co.	1,336 12 0
Watson, jun. (*accepted*)	1,318 0 7
Engineer's estimate (including paving £323)	1,783 0 0

For construction of the Mutton Brook outfall sewer, &c., for the Urban District Council. Mr. S. S. Grimley, A.M.I.C.E., engineer and surveyor.

Mutton Brook outfall sewer.

Griffiths & Co.	£7,007 18 0
Paterson	6,417 0 10
Wellerman Bros.	6,375 5 11
J. & T. Binns	6,132 18 0
Ballard	5,670 15 7
Wimpey & Co.	5,608 0 7
Hamiltons	5,602 0 6
Moss & Son	5,588 5 6
Dickson	5,580 7 3
Muirhead & Co.	5,194 5 6
Edwards & Co.	5,059 9 4
Brummell	4,901 10 2
Watson, jun., Southall (*accepted*)	4,874 9 5
Engineer's estimate (including castings and supervision)	5,890 5 4

Bridge Lane sewer and surface water drain.

Griffiths & Co.	£2,178 17 6
Wellerman Bros.	1,942 7 3
J. & T. Binns	1,913 3 6
Paterson	1,886 18 6
Wimpey & Co.	1,809 11 8
Ballard	1,771 19 6
Moss & Son	1,732 8 2

HENDON—*continued.*

Hamiltons	1,691 6 0
Dickson	1,602 14 0
Brummell	1,585 15 3
Edwards & Co.	1,527 15 11
Watson, jun (*accepted*)	1,441 15 10
Muirhead & Co.	1,327 15 9
Engineer's estimate (including castings and supervision)	1,576 3 3

Hoop Lane sewer and surface water drain.

Griffiths & Co.	£1,898 7 0
Wellerman Bros.	1,780 7 10
J. & T. Binns	1,665 2 0
Paterson	1,624 9 6
Hamiltons	1,575 16 8
Wimpey & Co.	1,572 18 6
Ballard	1,555 3 6
Moss & Son	1,523 13 0
Brummell	1,437 0 0
Dickson	1,409 6 2
Edwards & Co.	1,353 9 3
Watson, jun. (*accepted*)	1,238 0 2
Muirhead & Co.	1,217 12 9
Engineer's estimate (including castings and supervision)	1,631 9 10

KENT.

For erection of Hoo Chattenden Council school, for the Kent education committee. Mr. Wilfrid H. Robinson, M.S.A., architect and surveyor.

Milton Bros.	£2.994 0 0
Patrick	2.926 0 0
Bowes	2,900 0 0
Ballard	2,670 0 0
Baker & Son	2,628 0 0
Seager	2,599 0 0
Gates & Sons	2,598 0 0
Johnson & Co.	2,596 0 0
Parsons	2,595 0 0
Tong	2,590 0 0
West Bros.	2,587 0 0
Burrows	2,585 0 0
Skinner	2,576 0 0
Bishop & Son	2,455 0 0
Friday & Ling, Erith (*recommended*)	2,425 0 0

KING'S LYNN.

For the erection of an elementary school on the Paxton Terrace site. Mr. J. R. Cornell, architect, King's Lynn.

Foreman & Sons	£7,482 19 3
Barnes & Co.	7,449 0 0
Holden & Sons	7,400 0 0
Hawes & Son	7,395 0 0
Hall & Lawson	7,311 4 0
Saint	7,149 0 0
Read & Wildbur	6,999 0 0
Gray	6,992 19 6
Hurn & Sons	6,980 0 0
Youngs & Son	6,965 0 0
Dye & Allen	6,848 0 0
F. & S. Dickenson	6,847 0 0
Ives & Son	6,757 10 1
Cracknell	6,573 0 0
Shanks, Hunstanton (*recommended*)	6,565 0 0

LEYTON.

For making-up, &c., certain private streets. Mr. William Dawson, M.Inst.C.E., Council's surveyor, Leyton.

Griffiths & Co.	£2,155 6 3
Nunn	2,055 9 1
Anderson	1,956 16 3
Gibbons	1,952 11 4
Porter	1,931 18 8
Coxhead	1,920 0 0
Manders, Leyton (*accepted*)	1,828 0 10

LONDON.

For improving the existing stairway accommodation at the Vicarage Road school, Woolwich.

Harris	£189 0 0
Kirk & Randall	174 0 0
Kazak	170 0 0
Groves	160 0 0
Friday & Ling	160 0 0
Proctor & Sons	153 0 0
Mills	149 0 0
Thomas & Edge, Woolwich (*recommended*)	149 0 0
Architect's estimate	130 0 0

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LONDON—*continued.*

For erection of store shed, for the Walthamstow Urban District Council.

Motherwell Bridge Co.	£202 0 0
Kirk & Randall	158 0 0
Willmer & Sons	153 10 0
Croggon & Co.	150 0 0
General Iron Foundry Co.	147 10 0
Patent Axletree and Shaft Co.	144 9 11
Cross & Cross	142 13 6
Findlay & Co.	140 11 9
Hayward Bros. & Eckstein	131 15 0
Wright, Anderson & Co.	126 17 6
Green & Co.	126 0 0
Kenyon Iron Works Co.	121 16 0
Sands & Sons	120 17 3
Cross & Co.	119 0 0
Redpath, Brown & Co.	117 18 10
Ellwell	115 14 6
Goddard, Massey & Warner	110 17 10
Norton Bros. & Co.	109 0 0
Pierson & Co.	104 10 11
Saville	102 9 0

For the erection of the second portion of the Bow car-shed, for the L.C.C.

Holland & Hannen	£8.356 0 0
Mowlem & Co.	7,959 0 0
Kerridge & Shaw	7,945 0 0
Trollope & Sons and Colls & Sons	†7,900 0 0
H. L. Holloway	7,873 0 0
F. & H. F. Higgs	7,860 0 0
Kirk & Randall	7,630 0 0
Leslie & Co.	7,556 0 0
Holloway Bros., London	7,534 0 0
Rowley Bros.	7,474 0 0
J. & C. Bowyer	7,462 0 0
Chas. Wall, Ltd.	7,441 0 0
Patman & Fotheringham, Ltd., Islington, N. (*accepted*)	7,193 0 0
The architect's estimate	7,250 0 0

† Details of amounts making up the tender not given.

For painting of workmen's cottages at the Barking outfall works, for the L.C.C.

Symes	£284 0 0
Webb	249 0 0
Bull	219 8 3
Harris	199 0 0
Blower	181 7 2
Stokes & Sons	179 17 6
Proctor & Sons, Plumstead (*accepted*)	166 15 11

For painting the overhead sludge tanks at the Barking outfall works, for the L.C.C.

Symes	£497 0 0
Bull	490 1 0
Proctor & Sons	371 2 0
Blower	370 15 10
Stokes & Sons	303 18 0
Webb	295 0 0
Harris, North Woolwich (*accepted*)	285 0 0

For heating work at the Farrance Street school, Limehouse.

Wontner-Smith, Gray & Co.	£977 15 0
Stevens & Sons	915 0 0
Grundy	897 0 0
Burroughes & Sons	890 0 0
Christie	852 0 0
J. & F. May	830 10 0
Cannon & Sons	820 0 0
Yetton & Co.	813 0 0
Palowkar & Sons	794 0 0
Brightside Foundry and Engineering Co.	791 0 0
Cash & Co.	784 0 0
Fryer & Co.	739 0 0
Comyn, Ching & Co., Ltd., Long Acre (*recommended*)	686 0 0

For continuing boys' staircase and forming teachers' room at the Rockingham Street school, Newington.

Garrett & Son	£285 0 0
Holloway Bros. (London), Ltd.	279 0 0
Rice & Son	257 0 0
Downs	245 0 0
Marsland & Sons	235 0 0
W. V. Goad, 241 Camberwell Road (*accepted*)	229 0 0

LONDON—*continued.*

For the wiring and fitting for electric lighting of the second section of the central car repair depôt, for the L.C.C.

Barlow Bros. & Co.	£2,425 16 4
Lawson	2,320 2 6
Weston & Sons	2,043 12 9
Pinching & Walton	2,035 10 0
Newbald & Co.	2,024 8 5
Tilley Bros.	1,888 12 6
Johnson & Phillips	1,877 3 0
G. E. Taylor & Co.	1,863 19 6
Lawrance & Sons, Ltd., Wharf Road, N. (*accepted*)	1,702 17 3
The Central Motor Engineering Co.	1,571 8 3
Estimate of the chief officer of tramways	1,500 0 0

For forming an exit and an additional entrance, with staircase, &c., at the Monnow Road school, Bermondsey.

J. Garrett & Son	£625 0 0
Maxwell Bros.	615 0 0
Downs	588 0 0
Marsland & Sons	578 0 0
Akers & Co., Ltd., South Norwood (*accepted*)	448 0 0

For the execution of repairs to the paving of Blackwall Tunnel, for the L.C.C.

Mowlem & Co.	£825 16 8
Anderson	619 11 8
Wheeler & Co., Blackfriars Road, S.E. (*accepted*)	598 10 10
The estimate of the chief engineer	700 0 0

For the necessary borings in connection with the extension of the southern high-level sewer No. 2 to Nunhead.

Tilley & Sons	£381 7 0
Isler & Co.	263 0 0
Potter & Co.	208 16 0
Le Grand & Sutcliffe, Bunhill Row, E.C. (*accepted*)	157 16 0

MAIDSTONE.

For builders' work at Messrs. Wm. Hobbs & Sons' printing works, Maidstone. Messrs. Ruck & Smith, architects, 86 Week Street, Maidstone.

Lowe & Co.	£1,909 0 0
Shippam	1,768 0 0
Dixon	1,749 10 0
Wallis	1,748 0 0
Davison	1,724 0 0
Cox Bros.	1,714 0 0
Denne	1,710 0 0
Corben & Co.	1,699 0 0
Pearce & Sons	1,693 0 0
Ellingham	1,687 0 0
Barden & Head	1,675 0 0
Elmore & Son	1,620 0 0
Burrows	1,619 0 0
Seagar	1,595 0 0
Wallis & Sons (*accepted*)	1,584 0 0

NEWCASTLE.

For alterations and extensions to the Middle Boys' School, Newcastle. Messrs. A. R. Wood & Son, architects, Tunstall and Burslem.

Cooke	£3,850 0 0
Godwin	3,666 0 0
Gallimore	3,664 0 0
Grant	3,637 0 0
Grant & Son	3,577 0 0
Wilton	3,545 0 0
Heath	3,472 0 0
Taylor	3,465 0 0
Bell & Robinson, Stoke-on-Trent (*accepted*)	3,386 0 0

PLYMOUTH.

For erection of the County Court offices at the rear of the Guildhall. Mr. James Paton, borough engineer, Plymouth.

Pethick Bros.	£4,659 0 0
Andrews	4,390 0 0
Crockerell	4,218 0 0
Shellabear & Son	4,157 0 0
Wakeham Bros.	3,999 0 0
Roberts	3,998 0 0
Lapthorn & Co.	3,974 0 0
Coles	3,842 0 0
Pearn Bros., Plymouth (*accepted*)	3,649 0 0

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PINNER.

For five pairs of semi-detached houses, for the West End Park Estate Company. Mr. J. E. HENDERSON, architect, West End Avenue, Pinner.

MILSOM & BOOTH, Pinner (*accepted*)	£5,570 0 0

ROTHERHAM.

For the work required in erection of offices and dwelling-house, in Wellgate and Gerard Road, Rotherham, for the Amalgamated Union of Enginemen and Firemen, &c. Messrs. EDWARD HUTCHINSON & SONS, architects, 18 Howard Street, Rotherham.

Marshall	£1,767 13 8
Bell	1,750 0 0
Boot & Sons	1,749 0 0
Unwin	1,640 0 0
Chadwick & Co.	1,631 10 0
Saul & Sons	1,628 0 0
Snell	1,620 0 0
Green's Sons	1,610 0 0
Gray & Sons	1,535 0 0
Thornton & Son	1,481 0 0

WALES.

For the erection of a higher elementary school at Caerphilly, Glamorgan. Mr. D. PUGH-JONES, F.S.I., county architect, Cardiff.

W. Williams	£11,980 0 0
Lougher & Co.	10,528 10 6
Davies & Sons	10,300 0 0
Beames	10,098 0 0
J. Williams	9,950 0 0
Shail	9,900 0 0
Hamilton & Millard	9,650 0 0
Howells	9,491 7 0
BOND, Cardiff (*accepted*)	9,447 2 4
Jones	9,015 2 6
Hancock	8,691 6 9

For rebuilding the Fox and Hounds Inn and three shops, Troedyrhiw, near Merthyr. Mr. C. M. DAVIES, architect, Merthyr Tydfil.

Williams	£2,134 4 6
Jenkins	2,051 0 0
Jones Bros.	1,850 0 0
THOMAS, Merthyr (*accepted*)	1,800 0 0

WALLINGFORD.

For the erection of hygienic bakery, High Street. Mr. EDWIN G. HEARNESS, architect and surveyor, Wallingford.

	If Bakery Interior White Glazed Bricks.	If Plastered Walls.
Bosher & Son	£320 13 4	£286 17 10
Smallbone & Son	305 0 0	267 10 0
Brasher & Son	282 14 7	251 19 7
NAISH & SONS, Wallingford (*accepted*)	280 0 0	250 0 0

WORKSOP.

For erection of two shops, with stable, warehouses, and other outbuildings, and one cottage, on land in King Street, Hodthorpe, Whitwell, for the Worksop Co-operative Society, Ltd. Mr. E. ALLSOPP, architect, Sherwood Road.

Rowsell	£1,495 0 0
Ashley	1,490 0 0
Doncaster	1,486 10 0
Eastwood & Sons	1,395 0 0
Bowles & Sons	1,370 0 0
McCarrick	1,350 0 0
ILETT & SONS (*accepted*)	1,245 0 0

THE Arbroath School Board have resolved to expend over 2,000*l.* on the extension of Keptie School, for the accommodation of the supplementary classes.

THE directors of the London and Lancashire Fire Insurance Company have declared an interim dividend of 8*s.* per share, free of income tax (as compared with last year's interim dividend of 6*s.* per share), payable on November 1, 1910.

ON Tuesday last a public meeting was held at Bristol, the Lord Mayor presiding. It was decided to erect as a memorial of King Edward an equestrian statue, surrounded by figures illustrating his personal characteristics and the chief incidents of his reign, at a cost of about 10,000*l.*

VARIETIES.

MR. A. ERNEST PRESCOTT, the Eastbourne borough engineer and surveyor, has been elected President of the Institute of Municipal Engineers for the ensuing year.

THE Bury Town Council have decided that the limit of seven minutes an hour allowed for the emission of black smoke should be reduced to five.

A DISASTROUS fire causing from 20,000*l.* to 30,000*l.* worth of damage broke out on Saturday last at the shipyard of Messrs. Vickers, Sons & Maxim at Barrow.

THE Northwich Urban District Council contemplate an expenditure of 6,000*l.* for roads improvement and street widening.

A NEW Wesleyan chapel is about to be erected, at a cost of 500*l.*, at Trevone, Cornwall; and a new minister's house, at a cost of 775*l.*, at Penryn.

THE death has been announced at The Hague of William Maris, a well-known Dutch artist. With his brother Jacob he was among the best-known of the landscape painters of Holland.

THE syndicate who are promoting the Gourock Garden Suburb scheme will shortly apply to the Dean of Guild Court for leave to erect sixteen cottages on the new street running parallel with Cardwell Road.

THE Local Government Board have given their sanction to the borrowing of 11,645*l.* in respect of additional plant, and 5,000*l.* in respect of prospective expenditure, in connection with extensions to the Carlisle electricity works.

THE clerk to the Durham Education Committee stated last week that the present building programme of the county was for 113 new schools, for 57,000 scholars, at a cost of 821,000*l.*

THE Derbyshire County Council at their last meeting adopted plans for the proposed county offices at Derby. The cost of erection, exclusive of furnishing, will be about 18,000*l.*

A COTTAGE hospital is to be erected at Haywards Heath as a Mid-Sussex district memorial to his late Majesty. The estimated cost is 3,000*l.* The site has been given by Mr. J. Bradford and Capt. Sergison.

THE sanction of the Local Government Board has been granted for the Northwich sewage scheme at a cost of 8,727*l.* A further sum of 4,255*l.* will be required for the outfall works for duplication of the existing plant.

THE British Stone and Marble Co., Ltd., have taken new offices at Craven House, Kingsway, London, W.C. The sales department, both for their building stone and ferro-stone glazing, will be conducted at the above address.

THE Gillingham Town Council are taking steps to obtain a Provisional Order for the construction of a new pier at Commodore Hard. It is necessary the Council should take action immediately to secure the offer of the Rochester Bridge Wardens of 2,500*l.* towards the cost.

THE Liverpool City Council have agreed that application be made to the Local Government Board for sanction to the borrowing of the sum of 5,993*l.* in respect of the erection of the Rice Lane Council School. The building is to be of concrete, and is estimated by the surveyor to cost not more than 8*l.* per head. Application is also to be made for 6,264*l.* for alterations and additions to St. Augustine's School, Salisbury Street, and for the furnishing of the school.

MESSRS. MACWHANNELL & ROGERSON, architects, Glasgow, have prepared plans for a two-storeyed school to accommodate 1,200 scholars at Battlefield, N.B. The cost of the new building is estimated at approximately 13*l.* 8*s.* per scholar, exclusive of the estimated cost of 700*l.* for foundations and the cost of boundary walls, railings, furnishings, and professional fees. Subject to the approval of the Scotch Education Department the Cathcart School Board adopted the plans.

A PUBLIC institute, situated in Main Street, Bothwell (the funds for which were bequeathed by the late Mr. James Donald, a native of the village), was formally opened on Saturday afternoon. Mr. James T. Forgie, Mosspark, presided. The building stands on the east side of the Glasgow road, adjoining the public school. Entering through a covered porch, the entrance-hall gives immediate access to the games-room on the left with reading-room on the right. Beyond the reading-room is the billiard-room, with space for three billiard tables. A commodious cloak-room and lavatory convenient to the rooms are also provided, and on the upper floor ample accommodation is made for the caretaker. The building was designed by Messrs. Alex. Cullen, Lochhead & Brown, architects, Hamilton, whose scheme was selected in competition.

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THE TOWN PLANNING CONFERENCE.

(*Continued from page* 256.)

Cause and Effect in the Modern City.

Mr. H. V. Lanchester, F.R.I.B.A., said he would deal with the causes that have resulted in the various types of city as we find them at the present day. Only by such a course can we secure the knowledge necessary to bring our work in the future into harmony with the natural forces, and thus ensure that what we do should be on sound lines and likely to endure.

The causes influencing the outward aspect of the city are of the widest imaginable range, embracing the whole life of man, and it is hardly possible to conceive any factors, whether physical, psychological, racial, or social, that do not act and are not themselves reacted on by the structural environment of the community.

At the start we must consider the main purpose of the civic community as constituted at the present time. It has been the fashion to regard this almost entirely from an economic standpoint. Ideal influences may really, however, be more powerful than material ones.

For the distribution of its component parts and the subdivision of purpose that distinguishes the modern city one must admit an economic basis, but the subsequent way in which these parts are handled depends on the quality of the ideal, or rather on the resultant of the many ideals appertaining to the community.

We have the original city gradually taken up by commerce and exchange, the residential districts filling up by degrees the spaces between the star points composed of mills or factories, and the retail traders following along the main radial arteries. The most attractive district will naturally be selected by the wealthy, and the others will secure occupants on a basis of necessity or convenience. The governing or official centre will, unless firmly fixed by tradition, slip into a position between the commercial centre and the wealthy quarters, while the leading places of entertainment will gravitate in the same direction.

The formation of the "West End" is due to the fact that, the time of leisure and recreation coming towards the latter end of the day, man naturally turns his steps towards the brightness of the evening sky. Moreover, in the old days of the walled city, by far the pleasantest evening promenade must have been outside the western wall. The only towns not obedient to this rule are those in which the conformation of the city imposes a marked physical obstacle to the tendency towards such an arrangement.

Having maintained that the causes influencing cities are not mainly economic, it may appear inconsistent to admit that the general distribution of the city is chiefly determined on economic grounds. But one may admit it and yet deny that this general distribution bears the more important part in the impression received. For it needs investigation to grasp it, while the character of the buildings, their local massing, and arrangement are obvious to the casual observer. It is in these cases that the ideals come into play.

Thus the British convention for a church or a house differs far more from the French or the Italian than the merely material requirements demand, these differences being symbols of similar ones in the conventions of national life. The most difficult thing to uproot is tradition; tradition represents the ideal, and concerns itself but little with the genuine material requirements of the moment. Thus we find the English house designed to stand a more boisterous climate than the French; but the English house in a sheltered position remains English, and the French, however exposed, will be French. Again, when we took to building flats we gave them as far as possible the effect of the private house, and only gradually arrived at a more logical treatment. More important is to take the broad differences in the manner in which two nations would approach the problem of erecting, say, a Law Courts, a case in which the very name starts us on our way, when we compare it with the title Palais de Justice; ours, short and businesslike, suggests the aim of fulfilling the practical requirements in a convenient and economical fashion, while the other hints at the first necessity of creating a mental impression of the dignity and paramount force of the law. The varying importance attached to emotional influences of one kind or another must be regarded as one of the causes making for difference in the character of the city among the nations, and even in different districts.

There is a mass of ideals imposed by the public on the architect, and which are too powerful for him to resist, and these are of such force as to dominate the character of the city.

Is it not an almost invariable rule that the Anglican Church shall build in some form of Gothic? Again, how would it appeal to the householder if his garden were left unfenced, as in the United States? (even the garden city community compromises with posts and chains); while half our building by-laws are based on no real necessity, but on traditional ideals. As to the house itself, probably nothing determines the general character of the city so much as the dwelling unit. The Englishman's notion for a house "all his own" does more to fix on us the type of our city than any other consideration. As the sanitarian finds himself in accord with the separate-house system, we are bound to accept it as governing the general scale of a large proportion of our town areas, leaving us but a few salient points for the exercise of imaginative skill of a purely abstract kind.

Until national feeling is awakened, and we realise that our art is not a thing to be taken in specified doses at specified times, the ideal of the city as a thing of beauty in all the aspects of street, square, and park will receive but poor support from the general public.

Mr. John A. Brodie, city engineer, Liverpool, opened the discussion on the above four papers. He said he was somewhat unwilling to do so, because whereas he was a more or less practical man, the papers had rather dealt with theoretical questions which do not come, for the present at any rate, very prominently before people responsible for Town Planning. He confessed to being a little disappointed at the tone of the first two papers. The subject seemed a very large and important one, and deserving of a larger treatment than it had received at the two authors' hands. On Mr. Bonnier's paper he could not say much. They ought all to be a great deal the better for Mr. Lanchester's paper. In it had been pointed out a number of things which the surveyor and the local authority could and ought to consider, such as old buildings and matters of beauty. All the papers omitted the matters which he, as an engineer, considered of the greatest importance. The first thing he looked at from that standpoint was the means of communication from the central area of a city to the outer districts. Liverpool has recently been spending a large amount of money on the widening and straightening of main thoroughfares. During the past twelve years the total was 1,250,000*l*. It was quite safe to say that four-fifths of that money should never have been spent at all, for it went on the removal of buildings and the payment of consequent compensation. If there had been intelligent supervision at an early enough date, that expenditure would have been avoided. The Liverpool authorities had also recently constructed several miles of wide roads in the outskirts. The cost of those roads, when they passed through unbuilt-upon land, might be put at an average of 7,000*l*. per mile to the public authority, the landowner, of course, contributing his share of this. Coming nearer to the centre of the town, and to land built upon within the past forty years or so, the cost came to about 70,000*l*. per mile. Finally, within a mile of the centre the improvements have cost at about the rate of 350,000*l*. per mile. In considering town improvements the health of the children should be taken into consideration prior to questions of art. He pleaded that the subject should be treated on a large scale.

Mr. Thomas Adams, Town Planning Assistant to the Local Government Board, said he was particularly interested in Mr. Robinson's paper, which dealt with the subject of roads, a subject which touches everybody. With regard to the Conference, he suggested that when a full report of the meetings have been issued, there should be expert consideration of the views put forward, so that some practical result should accrue from it. It appeared to him that one of the functions of the Conference should be to show cause why they should be introduced into the matter. Architects ought to assert their position, for they had as much primary right as surveyors and engineers. There was much they could do.

In Berlin the necessity of making wide roads rendered the prevalent tenement system of high block dwellings almost a necessity, so that the rents received for each yard of frontage should be sufficient to pay for the cost of the roads. In England they wanted broad and narrow roads in the different localities which they suited. The Town Planning Act gave opportunities of co-operation between local authority and local authority, and also between the local authority and the owners in their area. In that respect this country was in advance of any other in the world.

Dr. Hegemann, of Berlin, vice-chairman, said he would like to corroborate what Mr. Adams had said. The new plan

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prepared for Berlin includes both very wide roads running out into the country and some narrow ones in some of the residential districts. It was also intended to imitate the English fashion of large and small houses. In Berlin they suffered from the excessively wide and too well-paved roads and the excessively high tenements. The plans now at the Royal Academy would show the whole scheme.

Mr. Hall Blyth, of Edinburgh, in speaking of the preservation of ancient features remarked that the Auld Brig of Ayr, which had been preserved, was not really the bridge about which Burns wrote his poem. The bridge just restored is only fit for foot passengers. What the people really needed was a useful bridge fit to carry all sorts of traffic.

Mr. F. S. Baker, F.R.I.B.A., Royal Architectural Institute of Canada, said it was a delightful surprise to him to find the Congress such a success. Town planning had received considerable attention in Canada; but it was approached in a different way to what it was here. It Western Winnipeg alone there were two hundred cities in their infancy.

Sir Aston Webb, C.B., R.A., the chairman, said that with regard to the architect's share in town-planning schemes they would all agree that it should be a very large one. Everyone knew that Christopher Wren laid out London on a scheme which was never carried out—a fact which London has regretted ever since. If the plan had been realised London would have been quite as convenient, much more beautiful, and equally adapted for commerce. A beautiful town was a concrete asset. With regard to the retention of the two Strand churches (which had been alluded to by Professor Baldwin Brown), Sir Aston Webb pointed out that the Royal Institute had taken their share in the movement. Artists had had much to do with the arrangement of Paris. In 1794 a group of them met together for the purpose of preparing a plan, and that plan is now to be seen at the Royal Academy. It could be observed how largely the artists influenced the magnificent lay-out by Baron Haussmann. It was in some such way that architects could most usefully come into the Town Planning Act. They in England desired to do their share in the beautification of their cities. Very often the ideal which they wanted was the real thing in the end. "Seen things are temporal, unseen things are eternal." Public authorities should pay attention to the ideal scheme. They could be perfectly certain that when an ideal scheme is prepared it could be carried out to the public benefit.

Wednesday Afternoon's Sitting.

Mr. John Belcher presided over the sitting in the Great Gallery on Wednesday afternoon.

Town Planning and Legislation in Sweden.

Dr. Ing. Lilienberg (Göteborg), in an address on the above subject, said that when dealing with Swedish towns one had to consider the great difference between them and the towns of most other countries so far as concerned the impression on their growth of government and legislation. The English towns had specially developed more freely and as the result of private enterprise than those of Sweden, which were more like German towns. One of the main reasons why Sweden in the seventeenth century could have been one of the most powerful of the European States was that its government, although always democratic, was strong; while the organisation of Russia and Germany was unsettled. When Sweden had lost its greater political power its government always kept up the influence over the interior conditions, and regulated the forming of the towns as well as the construction of buildings. So, since the beginning of the seventeenth century, the towns in Sweden had been built according to fixed plans. A great number of towns were then laid out by the orders of the kings and the royal charters were usually accompanied not only by drawings of plans that were to be followed, but also by regulations as to how those towns, generally speaking, were to be built. In the case of newly laid out towns, as well as in those already existing, a grant was made of the ground required by the inhabitants for their future main means of sustenance, and in this they saw the beginning of the great landed properties usually owned by Swedish towns. As a consequence the governing powers had a very direct and powerful influence on the life and future of the towns, but this patriarchal time was over. There was a long period of transition in Sweden which might be said to have had its beginning in the public law of 1734, in which was anticipated a special law touching the building of towns, and which lasted until such a law was forthcoming in 1874, or 140 years later. But during these 140 years of waiting building operations were fortunately of such a comparatively insignificant nature that they did tolerably well with Royal circulars and building by-laws for the various towns. In several cases these urban building by-laws contained not only technical stipulations, but also certain general ordinances for the regulation of the economic relations between the communities and the private land owner, such as by-laws concerning the surrender of property by compulsion for the carrying out of street improvements. In the 'fifties towns began to develop rapidly, and the desire to get stability and uniformity into the by-laws now became inevitable, and forced on the "Building Law for Towns" of 1874. This Act embraced only the technical regulations for the planning and building of towns in conformity with the requirements of hygiene, comfort, communication and protection from fire, and a civil law for the regulation of the judicial differences that might arise between the different economic interests that were of a conflicting nature in the execution of the town plan was not forthcoming till 1907. The author proceeded to give a detailed account of the contents of these two laws, and to show how town planning work in Sweden had developed under their protection. The town plan must be prepared so as to ensure as far as possible that the requirements of traffic in respect of ample space and convenience shall be supplied; that the light and air needed for health should be provided; that danger from fire should be guarded against; and that there should be the open spaces, the variety of construction, and the beauty necessary for æsthetic reasons. In new towns or new districts streets must as a rule be of not less than 59 feet, but where special circumstances made exceptional treatment desirable short streets might have a width of not less than 39 feet. Within two years of the law coming into force every town had to prepare a plan, and since the passing of the Act about 600 plans had been made and sanctioned. As the law was formulated it directly favoured the rectangular system, and most of the plans had been made according to this unpractical and monotonous type until about 1900. The author then dealt with the law of 1907, which contains regulations regarding the heights of buildings, the maximum number of families to be housed in a building, &c., and also deals with the allocations of the cost of road making between the community and the private owner.

Discussion.

The Chairman said they had learned a great deal from Sweden, and an Act had been passed in this country more or less upon what had been done in Sweden. They watched with great interest what took place there, and would learn by their experience.

Col. Plunkett remarked that he was the first to publish the Swedish law of 1874 in this country. In his opinion, the passing of that Act was the greatest achievement with regard to human civilisation that they owed to any country. They had more to learn from Sweden than from Germany in regard to town planning. The Act of 1874 was better than the Prussian Act of 1875, as it was compulsory on the local authorities to make a town plan, and it also gave them powers to make improvements in the older parts of the towns.

Mr. Joseph Fels asked whether there had been any law passed which enabled the public to get something of the increased values created by the public?

Dr. Lilienberg said he believed a law would be proposed next year in the direction alluded to by Mr. Fels.

City Improvement.

Professor S. D. Adshead, F.R.I.B.A. (of the Department of Civic Art, School of Architecture, University of Liverpool), said that no city can be possessed of civic dignity unless in places it conforms to a symmetrical binding together of parts, and unless it subordinates its units to the dictates of a scheme. If this be true, it follows, then, that the city must have at intervals a continuity of style—a style which we must more or less adhere to when a big improvement is under way, and this style must be something more than the stringing together of classical parts—it must be the outcome of scholarly research, strictly confined to what is pure and fundamental in the architecture of the past. We shall always have individual digression. The work may be of brilliant but specialised brains, but what he pleaded for is a consensus of opinion as regards the basis of a national style. National style in architecture, like fashion in dress, moves in cycles, and will ever do so. In its rotation purity and originality are always followed by pedantry and confusion. We in England are, he feared, at the present moment very nearly at the bottom of the wheel, and he was bound to admit that in New York they are pretty nearly at the top.

By intense application and continued research, Charles Follie MacKim has set a standard which others have

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followed. He has founded a great school, and as a result in America, if nowhere else, there is a national style of some worth. We shall achieve but little in this country until we study more seriously the vast field of knowledge which archæology and science has spread at our feet. Hence it was his opinion that if we as a nation are again to do pure classic architecture and carry out improvements of equal worth with what was done then, we must follow their lead, renew our studies, and so originate a modern and national style—a style which, once originated, will act as a powerful matrix in binding together the units of the town.

Provided we keep well before us and embody in our designs the essential requirements of our modern social system, the new materials and the latest inventions of science, we need have no fear that we shall be counted as pedants, or that our work will be dry as dust.

It matters not how great artists we be: we may play with form and colour as we will; but if we ignore the traditions of the past, attach no meaning to the orders, to rustications, wave ornaments, frets, dentals, and all the other insignia of architectural thought, then our buildings will have merely the interest of sand castles, the art of the pastrycook, and the glitter of the kaleidoscope. But apart from this question of style, yet very closely allied to it, comes the question of scale. More than half the mistakes that are made in connection with city improvements in this country arise out of a lack of appreciation of scale. By scale he meant not only comparative size, but also comparative appropriateness and fitness. He meant that to make a town look big it must be framed up in huge but simple lines, be filled in and interpenetrated by interests analytically separable and subordinate to one another. We must also remember that each building must satisfy the exact circumstances of its existence; the residence must take its place according to rank and express itself correctly, coming somewhere between the royal palace and the thatched cottage. Each must be in appropriate scale.

Where improvements are to be made in this country, and where æsthetic considerations arise, we cannot attach too great importance to the question of scale; the scale should be appropriate in rank and commensurate with the importance and character of the city which it stands to express. We do not want bigger features, less refinement, size and measurement alone, but what we want is simplicity of mass, a better relationship of parts, subordination of interest, higher structural development, with greater intricacy, more delicate detail, a more gradual approach to the climax of the mass, scintillation of interest carefully disposed, stronger contrasts brought about by more subtle qualities in the approach, trees brought hard up to stone, flowers brought hard up to grass, but foliage, formal and informal, many qualities in the facework of the stone, subtleties in the colour scheme of the flowers, velvety lawns, pasture lands, and qualities even in the grass. But after all, it is only by a bigger comprehension and a better appreciation of the subtleties of design that we can hope to get better scale in the architecture and composition of our towns. To bring about sequence in style and correctness of scale we must have combination of effort and subordination of interest. This under modern conditions is a most difficult thing to obtain. We can hardly hope to arrive at it by legislation. Something might be done by offering a prize for the best building in certain streets, the design to be subject to restrictive conditions as in Paris, or as is now being arranged for in connection with the best building annually erected in Fifth Avenue, New York. This is an incentive to subordinate an isolated building to a general effect. Societies like the Garden Cities Association and the Co-partnership Tenants can do much; so can the big landed proprietors and those responsible for the architecture which is being constantly erected on many of our estates. Education and a general consensus of opinion amongst those responsible for the direction of education can do the rest. We shall never have great architects one and all, but we may have outstanding men; and if these, while unconsciously expressing their individuality, direct their efforts to the same end, the work of the minor men will, though not outstanding, never be trivial, irritable, or ruinous to the whole; in most cases it will merely be tame.

Discussion.

The Chairman said so many points had been raised in the paper that it would take a very long time to adequately discuss them. The lecturer's point seemed to be that they must improve their architecture before they began town planning, and it was to be hoped that the excellent education young architects were now receiving would result in the turning out of men capable of dealing with things on a large scale. Mr. Burns told them that they were rather better than other people, but Mr. Adshead considered they were at the bottom of the wheel. Still they had to remember that the conditions in this country differed from those of others, and atmosphere had very much to do with the materials used and with the effect of buildings. They missed their grand chance in London after the great fire, when Wren prepared a plan which, if carried out, would have made London the admiration of the world. But there was always a difficulty in this country in passing through large schemes, and there was much resistance to Wren's scheme. They had had before them all kinds of plans for town planning, and he saw no reason why they should not combine both the straight lines and the curved streets laid out to give delightful vistas, for that was what was apparently being done in Sweden.

Mr. S. Bylander said that, speaking as an engineer, he very much appreciated Mr. Adshead's opinions as to simplicity and repetition of detail.

Greater London.

In his paper on the above subject, Mr. G. L. Pepler, F.S.I., after describing the traffic difficulties of the Metropolis, introduced and illustrated with a map a suggestion that has previously been made in various forms and has recently been most clearly put forward by Mr. D. Barclay Niven for a great girdle round London. Central improvements, he said, are so costly, although the traffic problem grows more serious every day, that it would appear wise to consider a scheme that might do a lot to relieve central congestion and at the same time profitably conserve a belt of green, link up existing suburbs, and make provision for the future. Also a far greater area than the present county would be affected, and therefore the possibilities of raising revenue also enlarged. At present means of concentric communication are so poor that a great deal of traffic has to come in and out again merely because it cannot go direct.

Curiously enough, also, while many London dormitories are a great deal further out than ten miles, there is round London at about the ten-mile radius an almost complete ring of very open country, a lot of it at present being used for agriculture. I have been over most of this ground with a view to this Paper, and on the map have traced out the line that I think this girdle should take.

The line, as far as possible, follows open country, utilises existing bridges, which of course would have to be widened, and avoids steep levels, or where they are inevitable follows the line of a good existing road. Fortunately also for its purpose, the suburbs it would cut through have developed longitudinally rather than laterally, so that the proposed road could be steered to cross at the narrowest parts. An instance of this is at Croydon, where approaching from the west I get right to the main Brighton road without crossing built-upon land. Also in many cases I have diverted it round built-upon areas in preference to widening the existing road, which is a method strongly urged by the Traffic Branch of the Board of Trade.

In a paper such as this on the general problem of Greater London it is not possible to go into the fullest detail of one suggested remedy, but, briefly, some of the advantages of such a ring road would be:—

1. To provide a means by which a great deal of fast traffic could circle London instead of passing through.
2. Generally to link up existing radial roads and outer suburbs.
3. To open up a great deal of fresh land which, if properly town-planned, could form an almost continuous garden suburb round London, with the ring as its basis.
4. Open land adjoining the ring could in many cases be preserved as park land, so that if boldly conceived and properly made it would form a great park way.
5. It would assist the forming of outer markets and so save much produce going into London only to come out again.

As to the form I would suggest that it should link up all means of traffic by road, tram, and rail. Especially in the latter case would it be valuable and relieve central congestion, and if the motive power of the railway were electric its proximity to the boulevard would be but little nuisance, as it could be put in a shallow cutting so as to go under all cross-roads, and be crossed by frequent level foot-bridges.

With regard to road traffic, I would have one smooth paved road reserved for fast traffic only, with a penalty for use by vehicles unable to go at least twelve miles an hour, which would be a great encouragement to motorists to use it in view of the almost continuous ten-mile speed-limits on most of our radial roads.

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Another road should be reserved for heavy mechanical traction, and specially paved to that end.

The section shows the whole suggested arrangement of the boulevard, which may be ambitious; but even if some parts of it are in advance of present needs, now is the time to buy the land, or at least prepare the scheme and fix the values, carry out what is immediately necessary, and only carry out the further developments when they become imperative. It could quite well be made in sections between radial roads, and would form a grand opportunity of apportioning labour to fit in with phases of unemployment, as recommended by the Poor Law Commission.

We must have plenty of grass and trees, and those of us who have seen the Berlin trams running through grass would welcome the same plan here.

In the section, to make drawing clear, I have shown houses fronting this road, but probably in most cases in future suburban development we should aim for improved highways with few houses directly fronting them, but rather set back round greens or facing narrow and inexpensive side roads only constructed for the purely domestic traffic of the houses facing them.

Now as to cost. The Development and Road Improvement Funds Act has established the principle that highways are a national as well as a local matter, and it is obvious that a great road such as this, linking up so many highways to all parts, has an especial national flavour. May I also point out while on this question that London itself is also a national and imperial concern? We see other nations and other portions of our Empire making their capitals national monuments, and surely London has paramount claims to such treatment. Compare the size and importance of London with Paris, and at the same time remember that Paris has recently entered into a scheme of improvements costing 36,000,000*l.*

The Development Act has also established the principle that when a new highway is made the authority making it may purchase the land on either side of it to a distance of 220 yards. The first thing therefore would be to purchase a strip a quarter of a mile wide for the whole length of the road, which is about sixty miles long: or a total area of 9,600 acres. The average price of this land, balancing one thing against another, should not exceed 500*l.* an acre, or a total of 4,800,000*l.* Of this the actual way, including roads, pleasance, and railway, would only take up a width of 326 feet, or a total area of 2,371 acres, leaving 7,229 acres to be re-sold or leased. No doubt sufficient land for oases could be retained and the balance sold to bring in an average of 800*l.* an acre on, say, 7,000 acres, making a total return of 5,600,000*l.* The probable profit on the land at a modest estimate would therefore be 800,000*l.*, which would certainly pay for the mere road construction and pleasances, and the trams and railways should be treated separately as business concerns paying for their own construction. Such an estimate can only be rough, and has left out of account where the land would be taken from existing public lands; but if all such matters were taken into account I think the estimate will give a very fair guide.

Mr. Bingham said that one of the difficulties which were likely to be met with in the administration of the Act would be the side issues raised. The majority of people were in favour of the Act, and desired to administer it to the benefit of everybody. Local authorities should try to smooth away the difficulties by coming into contact with owners. It was the experience of many that owners were anything but impossible people. There was at present a narrow-mindedness on the part of local boards, who asked what particular good the Act would do for them. They should rather ask what good it would do for London as a whole.

Mr. Watkins put in a plea in any scheme for consideration for the poorer classes. He hoped they would not be taken too far away from their work.

Dr. Freemantle welcomed the proposed circular road. His district of Hertfordshire reached within ten miles of London Bridge. To get from one side of the county to the other it was quicker to come up to London. For the same reason the County Council held many of its meetings in London, and some of their officers were stationed there. The project would also have an important bearing on the establishment of factories outside the congested centre, and facilitate commercial inter-communication.

Mr. Edwin T. Hall, the chairman, congratulated Mr. Pepler on the information contained in the paper. It was not suggested that the London County Council should do all the business. The theory was that the different localities should work together in getting this great ring road round London. Berlin had three such rings. It was highly probable that if they started in London with the outer ring the inner ones would follow.

The Restraint of Advertising.

Mr. Richardson Evans in his paper on the above subject said:

It is the merest truism to say that one of the main objects of the movement of which this Conference is destined, we hope, to mark a memorable stage, is to secure in the cities and suburbs, in the towns and villages of the future, a reasonable standard of beauty.

Let me state at once the thesis I have to maintain. It is that if you want your good work to last, you must provide for the regulation of *all* forms of signs and notices which are addressed to the sight of those using public thoroughfares and public places in your cities beautiful, your garden suburbs, your model manufacturing quarters, your sagaciously-planned lines of traffic and communication. What is in question is the limitation of the right of individuals to play for their own purposes and at their own discretion upon the eyes of their fellows. Posters and placards may, or may not, come within the bounds of toleration; but they will take rank with all sorts of other legible symbols which in ordinary speech no one calls "advertisements." The huge gilt letters announcing a hotel or a hospital or a theatre or, it may be, a town hall, would fall within the range of regulation. So would all the plates in vivid enamel which municipal authorities are quite as proud of employing as the soap makers or motor-spirit vendors.

One other preliminary caution is necessary to secure a calm hearing of my case. I am pleading not for prohibition but for regulation, and for regulation on lines which will be consistent with practical utility and convenience. The object of this Paper is to suggest that in the organisation of town-planning enterprise the remedy will be applied, and that once the better way is adopted in the garden cities it will, by sheer force of the instinct of rivalry and imitation, be adopted in the brick-and-mortar wildernesses of the earlier age. In the very worst of the old towns are elements which it is worth an effort to save. The slowly moulding processes of history, the gentle touch of time have given to the seats of ancient habitation a homely human interest which the settlements of the newer and better model will take years—perhaps generations—to acquire. The moral I desire to enforce is that if you want the sweetness to mellow you must, above all things, take steps to preserve it from the first from any risk of taint. The practice of appealing to the eye by huge and vivid lettering or signs is of comparatively recent growth, but it has taken so firm a hold that many people have come to regard it as essential to the life of trade. In a sense this is true. So long as everyone is at liberty to announce himself no single person can afford to be modest. But a moment's reflection will show that everyone suffers in the hurly-burly. The more the sight of the community is assailed the less can the sight perceive with discrimination. Senses that are habitually subject to the coarsest stimulus must lose the power of delicate appreciation. So the process has become one of the frantic multiplication of eyesores—each competitor struggling wildly to outblaze and obscure the performances of his fellows. I put it to anyone who has ever tried to find the particular shop he wanted in a typical London street whether the higgledy-piggledy of placards and huge letters and blazing signs helps or hinders him. If the object of business be to serve the needs of the community the most effective and economical way, the existing anarchy is dead against the interests of trade. Unfortunately, the evil is entrenched in custom, and custom yields but slowly to common sense. We must turn to the fresh field which the town-planning movement is opening up.

The vital point, here and to-day, is that the administrators of town-planning societies or companies have the power which less fortunate authorities have sought—in vain as yet—to obtain. They have only to make it part of their constitution, to insert in all agreements with those who purchase or lease from them sites or premises, a stipulation to the effect that no notice visible from any part of the public area shall be affixed or erected unless it conforms to conditions carefully prescribed in the deed.

All the security which I desire to see established could be obtained by a simple rule, that everybody would understand beforehand, and that could be enforced by the impartial adjudication of the measuring-tape. Time does not allow me to go into technical illustrations of the practical working of the covenants I suggest. But the principles can be briefly indicated:—

I. As regards signs on buildings—(*a*) No letter to exceed a prescribed size; (*b*) The sign not to be above a prescribed height above the ground level; (*c*) The space occupied by the sign to have a defined ratio to the whole superfices of the exterior; (*d*) The sign to be on the surface of the wall and be part of its substance. Where, as an exception, hanging signs are approved, there would be, of course, conditions for struc-

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tural security; (e) In certain cases it might be provided that the sign should be only in a prescribed position.

The scale would vary, of course, from prohibition to latitude, in accordance with the character of the area from which the sign would be visible, whether manufacturing, commercial, residential, or public pleasure ground.

II. As regards poster display and bills containing official announcements or relating to matters of public interest, the directors themselves ought, I think, to provide reasonable facilities—retaining ownership in the sites and structures, and letting spaces at fixed rates. Where the hoarding form would be suitable it should have a neat architectural character and the bills should be disposed strictly within the frame. The directors should retain power to veto the display of any poster that in design, or colouring, or scale would be unworthy, or offensive, or demoralising. I confess I do not myself love posters, but a well-ordered display of really good bills, pictured or printed, might please many. It has often occurred to me that on roadsides shelters might be provided, the interiors of which—or even the exteriors—would be decorated with this form of artistic work. There would be a keen competition then amongst the bill-posters for the privilege of pleasing rather than of attacking the eye.

As regards street plates, direction posts, and similar permanent official notices, the managers of a garden city would have a free hand and a most remunerative opportunity of showing how excellently things may be done within their limits which, as a rule, are indifferently contrived elsewhere.

I venture to claim that under the system I have sketched there would be reasonable liberty for those who want to announce themselves or their concerns, while they would gain by the existence of restrictions on the license of others. The community at large would be free from the haunting fear that the beauty they valued was in daily jeopardy; architects would be encouraged to do their finest work by the certainty that it would not be degraded by after-treatment or by an incongruous environment, while the creation of garden cities would be rendered an assured commercial success in virtue of the fact that the policy of authoritative control would guarantee the preservation in unimpaired and ever-increasing beauty of features which no town of haphazard growth can offer.

Discussion.

Mr. A. T. Taylor said that as their representative he could state that the London County Council were in sympathy with the Conference. The restraint of public advertising had long been a vexed question with them; their powers were not at present adequate, and they were asking for additional Parliamentary powers to restrain the owners. Some owners seemed to think that the side of their premises was a field for advertisement. In his opinion a distinction ought to be drawn between referring to the occupations carried on within the building, and those which bore no relation to it. The Council had now set their faces against intermittent signs at night. These were unfortunately permitted some years ago. The ornamental hanging sign was a different matter, and was to be commended. It was to be hoped that a result of Mr. Richardson Evans's valuable paper would be the passing of legislation to facilitate the restraint of public advertising.

Mr. W. D. Caroe, M.A., F.S.A., said that personally he thought the paper was one of the most important read at this Conference. It was to be regretted that only five counties had as yet taken advantage of the available legislative control over public advertising. One saw fine efforts at town planning almost nullified by the vulgarity of the advertisements which are allowed to exist. It was a pleasure to hear that the London County Council were about to take the matter up. At Cardiff there is one of the finest opportunities of town planning. Yet the first thing that meets the eye is a hoarding 40 feet or 50 feet high; the river also was similarly disfigured on both sides. At Oxford and Cambridge the visitor has to run the gauntlet of hoardings which almost take away all pleasure from these charming cities. He would suggest that the London County Council should be empowered to prohibit posters of more than a certain size—say 6 feet by 3 feet. This would be a vast benefit, and would be a saving to the public who in the end have to pay for all these hoarding advertisements.

Mr. E. T. Hall said he was certain the Royal Institute as a body, were in keen sympathy with the view Mr. Richardson Evans had expressed. It seemed little short of a scandal that after a nice building was put up it should be covered by letters which destroy its effect. People could get on quite well without them. There was less objection to the advertisements on a temporary hoarding, more especially if the hoarding was laid out in panels, and the advertisements were strictly restricted to that panelling.

In order to enable the many visitors to the Town Planning Exhibition, now open at the Royal Academy, to appreciate the various points in the plans and models exhibited, the Secretary-General of the Town Planning Conference, Mr. John W. Simpson, F.R.I.B.A., has arranged that guides shall conduct a party each day through the galleries and give full explanation. This we consider an admirable arrangement.

The parties will leave the Central Court each day at the hours of 10.30 A.M., 12, 3 P.M., and 4.30 P.M.

TRADE NOTES.

The Marsden Tiles, Ltd., announce that they have removed their London address from 23 Farringdon Avenue to 10 Maddox Street, W.

The Christ Church Schools, Folkestone, are being supplied with Shorland's patent warm-air ventilating Manchester grates by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

We understand that Messrs. Newton, Chambers & Co., Ltd., of Thorncliffe Ironworks, near Sheffield, have been favoured with an order by H.M. Office of Works for a 130,000 gallons cast-iron tank, erected complete at Edinburgh Castle.

We have received a catalogue from the Richmond Gas Stove and Meter Company, Ltd., of 132 Queen Victoria Street, London, E.C. We gave some particulars of their new gas-steam radiators in our issue of October 8 last year. Briefly, the system is as follows:—The radiator resembles the usual double-loop steam or hot-water radiator; at the foot is a gas-burner running along the base; above is a small boiler filled with water; only a small quantity is required. Shortly after the gas is lighted the water gives off the required steam, which rises through the loops and radiates the heat. The supply of gas burning is automatically controlled by the steam pressure on the regulating valve, and as the pressure of steam rises the consumption of gas is reduced. The burner is fitted with a Richmond gas and air adjuster, which insures perfect combustion. A gauge-glass indicates the quantity of water in the boiler.

The works in connection with the additions and alterations at the Savoy Hotel, Strand, London, W.C., which, in consequence of the illuminated scaffolding, has caused considerable notice, and by means of which the alterations have been carried out in an unusually short period of time, are practically finished. The patent scaffolding was supplied by the Patent Rapid Scaffold Co., of 124 Victoria Street, S.W. For the lining of the walls throughout the bathrooms, Chance Bros.' Vitreous tiles have been used. The work of fixing has been carried out by Burke & Co., of 43 Rathbone Place, W.

It is proposed to erect a new music-hall in Huntress Row, Scarborough.

Residents of Guildford have purchased an estate of twenty acres on the outskirts of the town with the intention of developing it on garden city lines.

The architect for Mr. Hammerstein's new Opera House is Mr. Bertie Crewe, of 75-77 Shaftesbury Avenue, London, W.C.

The Cardiff City Council have decided to erect a new fire station at Cathays Park, and designs for the building are to be invited in competition.

The fourth annual Business Exhibition was opened yesterday at Olympia. An interesting feature of last year's Exhibition was the inventors' section. There are several novelties under this heading this year.

A new picture palace is to be erected on an important site, with a frontage of 113 feet 6 inches to Kew Bridge approach on the Middlesex side. A prominent feature will be the main entrance, surmounted by a dome, with the principal lines of the building picked out with electric lamps. Messrs. Palgrave & Co., 28 Victoria Street, S.W., are the architects.

The National Association of Hungarian Ironmongers are organising an International Exhibition of novelties and patents of the iron and engineering industry, which will take place in the Industry Palace at Budapest in May-June 1911. The Exhibition will be under the high protection of his Imperial and Royal Highness the Archduke Joseph, and with the assistance of the Royal Board of Trade of Hungary.

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Cathedrals and Abbeys of England.

The Publisher desires to intimate that no copies containing Cathedral Plates can be supplied unless the date of the issue, as well as the name of the Cathedral, be given on application. The charge for any number containing Cathedral Plates published previous to January 1910, is 6d. Further lists will be published in subsequent issues.

LINCOLN.

View from South-West	January 1, 1897
Chapter-house	January 1, 1897
Angel Choir	January 1, 1897
Triforium	January 1, 1897
Lesser Transept	January 1, 1897
Nave (East)	January 8, 1897
South Aisle	January 8, 1897
Central Doorway	January 8, 1897
Details, Doorway	January 8, 1897
Doorway, West Front	January 8, 1897
North Aisle	January 15, 1897
Full View, Angel Choir	January 15, 1897
Gables and Pinnacles	January 15, 1897
Arcade	January 15, 1897
Choir and Nave (West)	January 22, 1897
General Exterior View	January 22, 1897
Ground Plan	January 22, 1897
Interior	January 22, 1897
West Front	January 22, 1897

ELY.

West Front	January 29, 1897
The Octagon	January 29, 1897
Transept	January 29, 1897
North Choir Aisle	January 29, 1897
General View of Choir	February 5, 1897
Choir from Octagon	February 5, 1897
Ground Plan	February 5, 1897
Choir Screen	February 5, 1897
Nave from Octagon	February 12, 1897
North Aisle (West)	February 12, 1897
The Reredos	February 19, 1897

WINCHESTER.

The Choir	February 26, 1897
West Front	February 26, 1897
West Door	February 26, 1897
View from North-West	March 5, 1897
South Aisle (West)	March 5, 1897
The Nave	March 12, 1897
South Aisle (East)	March 12, 1897
North Aisle	March 19, 1897
The Great Screen	March 19, 1897

SALISBURY.

The Choir and Nave (West)	March 26, 1897
View from North-East	April 2, 1897
South Side	April 2, 1897
South Choir Aisle	April 2, 1897
West Door	April 9, 1897
Presbytery Altar, &c.	April 9, 1897
View in Lady Chapel	April 9, 1897
Chapter-house	April 9, 1897
North Porch	April 9, 1897
East End of Choir	April 16, 1897
North Choir Aisle	April 23, 1897
North of West Front	April 30, 1897

NORWICH.

View from South-East	May 7, 1897
The Nave	May 14, 1897
The Choir	May 14, 1897
The Transept	May 21, 1897
The Aisle	May 21, 1897
Exterior with Apsidal Chapel	May 28, 1897
Exterior Buttresses	May 28, 1897
The Cloisters	June 4, 1897
View from Cloister Court	June 4, 1897
Interior North Side	June 11, 1897
Various Details	June 11, 1897

ST. PAUL'S.

The Cross	June 18, 1897
Ground Plan	June 18, 1897
Wren's Plan	June 18, 1897
West Front	June 18, 1897
Choir looking East	June 18, 1897
Nave looking West	June 18, 1897
South Aisle of Nave	June 18, 1897
Choir Stalls	June 25, 1897
Entrance to Choir Stalls	June 25, 1897
Gate in South Choir	June 25, 1897
View in Nave, with Wellington Monument	April 1, 1898
Gate, North Choir Aisle	April 1, 1898
Nelson's Tomb	April 8, 1898
Triforium, &c.	April 8, 1898
Nave and North Transept	April 15, 1898
Roof, &c., looking East	April 22, 1898
Roof, &c., looking West	April 22, 1898
Apse, &c.	April 29, 1898
North-West Chapel	April 29, 1898
North-West Tower, &c.	May 6, 1898
Geometrical Staircase	May 6, 1898
West Window	May 13, 1898
Library	May 13, 1898
The Reredos	May 20, 1898

CANTERBURY.

Ground Plan	July 2, 1897
General View	July 2, 1897
South Transept, &c.	July 2, 1897
Nave (East	July 2, 1897
Tomb in Martyrdom	July 2, 1897
Cloisters (South-East)	July 9, 1897
North Choir Aisle (West)	July 9, 1897
Choir	July 16, 1897
Warriors' Chapel	July 16, 1897
Plan of Cloisters	July 23, 1897
Entrance to Martyrdom, &c.	July 23, 1897
North Aisle (East)	July 23, 1897
The Martyrdom	July 30, 1897
Section of Nave and Aisles	August 6, 1897
Section of South and North Transept	August 6, 1897

CANTERBURY—*continued.*

Section of Elevations and Details	August 6, 1897
Becket's Crown, &c.	August 6, 1897
Tomb of Black Prince	August 13, 1897
View from Trinity Chapel	August 20, 1897
Organ Screen with Statues	August 20, 1897
Capitals	August 20, 1897
Norman Doorway	August 27, 1897
The Crypt, &c.	August 27, 1897
Norman Arcade	September 3, 1897
Pilgrims' Steps	September 3, 1897
North Ambulatory	September 10, 1897
Crypt, North Transept	September 10, 1897
South-east View	September 17, 1897
North from Precincts	September 24, 1897
Dean's Chapel	October 1, 1897
North Aisle Crypt	October 1, 1897
Trinity Chapel	October 8, 1897
Crypt Chapel	October 8, 1897
The Chapter house	October 8, 1897
St. Gabriel's Chapel	October 15, 1897
The West Door	October 15, 1897
Distant View, Trinity Chapel	October 22, 1897
Capital in Crypt	October 22, 1897
The Baptistery	October 29, 1897
Doorway in Cloisters	November 5, 1897
Crypt, Half-length	November 12, 1897
South Transept (North-West)	November 19, 1897
South Choir Transept and Norman Turret	November 26, 1897
South-West Corner	December 3, 1897
End of Chapter-house	December 10, 1897
Effigies	December 17, 1897
Part of Screen to Dean's Chapel	December 17, 1897
South Transept from North	December 24, 1897
South Transept Elevation	December 24, 1897
Brackets and Capitals	December 31, 1897
Do.	December 31, 1897

GLOUCESTER.

Cloisters, South-East	January 7, 1898
Choir looking East	January 7, 1898
Crypt	January 7, 1898
Do.	January 7, 1898
Plan	January 7, 1898
North Aisle of Nave	January 14, 1898
Chapel in Crypt	January 14, 1898
Monks' Lavatory	January 21, 1898
East-end South Transept	January 21, 1898
Cloisters	January 28, 1898
South Choir Aisle	January 28, 1898
West Front	February 4, 1898
Lady Chapel	February 4, 1898
Choir looking West	February 11, 1898
South-West Corner	February 18, 1898
Piscina in Triforium	February 18, 1898
Sedilia	February 25, 1898
North Aisle looking West	February 25, 1898
South Porch	March 4, 1898
View from North-East	March 4, 1898
South Aisle looking East	March 11, 1898
Chapel of St. Andrew, &c.	March 11, 1898
Nave looking West	March 18, 1898
Crypt	March 18, 1898
View in Cloisters	March 25, 1898
Doorway, &c.	March 25, 1898

PETERBOROUGH.

View from North-West	June 3, 1898
Sanctuary	June 3, 1898
Towers, Pinnacles, &c.	June 10, 1898
Choir looking East	June 10, 1898
Ground Plan	June 10, 1898
Chapel of St. James	June 17, 1898
South Aisle, &c.	June 17, 1898
Vaulting, &c.	June 24, 1898
South Door (East)	June 24, 1898
South Door (West)	June 24, 1898
South Transept, &c.	July 1, 1898
Retro-choir (Roof)	July 1, 1898
View from Palace, &c.	July 8, 1898
Retro-choir	July 8, 1898
Details	July 8, 1898
East End	July 15, 1898
Triforium	July 15, 1898
Do.	July 22, 1898
View looking North-West	July 29, 1898
North Transept, &c.	July 29, 1898
Nave (North-West)	August 5, 1898
Old Cloister Wall	August 5, 1898
Cheese Moulding	August 5, 1898
Sanctuary, &c.	August 12, 1898
South Aisle (West)	August 12, 1898
Nave (East)	August 19, 1898
Doorway, &c.	August 19, 1898
Top of Central Gable	August 19, 1898
Choir and Nave (North-West)	August 26, 1898
West Front	September 2, 1898
West Front in 1837	September 2, 1898
West Front (Plans, &c.)	September 2, 1898

ST. ALBANS.

View from South-West	October 21, 1898
Nave, &c.	October 28, 1898
West Front	November 4, 1898
Lady Chapel	November 11, 1898
Tower and South Transept	November 18, 1898
Behind Screen	November 18, 1898
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South Aisle, looking East	December 2, 1898
The Screen	December 9, 1898
The Screen (Details)	December 16, 1898
View from South-East	December 23, 1898

ST. ALBANS—*continued.*

General View	December 30, 1898
Doorway, South Transept	May 26, 1899
Doorway in South Aisle	May 26, 1899
Virgin and Child at Back of Reredos	May 26, 1899
The Watch Gallery	May 26, 1899

DURHAM.

View from the Weir	January 6, 1899
Galilee (North)	January 6, 1899
Galilee, with Wall of Church	January 6, 1899
The Choir, looking West	January 13, 1899
Vaulting, &c.	January 13, 1899
Arcade, Chapter-house	January 13, 1899
West Tower from Cloister	January 20, 1899
Crypt under Dormitory	January 20, 1899
Triforium, &c.	January 20, 1899
View from Precincts	January 27, 1899
Galilee (South-East)	January 27, 1899
Vaulting of Chapel of Nine Altars	January 27, 1899
South Aisle, looking West	February 3, 1899
Entrance to Chapter-house	February 3, 1899
Galilee (North-East)	February 3, 1899
View from South-West	February 10, 1899
Lantern of Central Tower, &c.	February 10, 1899
Detail of Central Tower, &c.	February 10, 1899
North Transept	February 17, 1899
North Porch	February 17, 1899
West Door	February 17, 1899
Ground Plan	February 17, 1899
The Dun Cow	February 17, 1899
From St. Oswald's	February 24, 1899
Details, North Window, Chapel Nine Altars	February 24, 1899
Arcade, Inside Wall of Nave	February 24, 1899
Bishop's Throne	March 3, 1899
Chapel, Nine Altars (North)	March 3, 1899
Nave, looking East	March 10, 1899
North Porch	March 10, 1899
Galilee Doorway, West; North Aisle of Church	March 10, 1899
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Choir Vaulting looking West	March 17, 1899
East End South Choir Aisle, looking into Chapel of Nine Altars	March 24, 1899
South Aisle looking North, Transept	March 24, 1899
Entrance Crypt from Cloister	March 24, 1899
Galilee looking South-East	March 31, 1899
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Nave, looking West	April 7, 1899
Looking Across Nave	April 7, 1899
Sedilia, &c.	April 14, 1899
Triforium Bay of Choir, North Side	April 14, 1899
North Aisle from Chapel of Nine Altars	April 21, 1899
West End of North Aisle	April 21, 1899
From Landing Stage	April 28, 1899
Ancient Font, with Canopy	May 5, 1899
Chapter-House (East)	May 12, 1899
Arcade, Central Tower	May 12, 1899
Detail of Capital	May 12, 1899
Cathedral Church	May 12, 1899

ROCHESTER.

View from Castle	June 2, 1899
Nave and North Transept	June 2, 1899
The Choir	June 9, 1899
Nave looking West	June 16, 1899
Doorway, South Choir Transept	June 16, 1899
Details, West Doorway	June 16, 1899
Plan	June 23, 1899
The Screen	June 23, 1899
The Crypt	June 23, 1899
Entrance to Crypt and South Choir Transept	June 23, 1899
Looking South-West	June 30, 1899
Nave Arches	June 30, 1899
The Triforium	June 30, 1899
East End of Choir	June 30, 1899
Western Turrets	June 30, 1899

BRISTOL.

Exterior looking South-East, with Gatehouse	July 7, 1899
Exterior looking South-West looking North-West	July 14, 1899
Exterior looking North-West	July 21, 1899
South Aisle looking East	July 28, 1899
Nave looking East	August 4, 1899
Arcade, Elder Lady Chapel	August 11, 1899
South Choir Aisle showing Roof	August 11, 1899
Exterior looking South-East	August 18, 1899
Choir looking East	August 18, 1899
Elder Lady Chapel looking East	August 25, 1899
Door from Cloisters into South Transept	August 25, 1899
Plan	August 25, 1899
Entrance, Berkeley Chapel, in South Aisle	September 1, 1899
Roof in Vestibule to Berkeley Chapel	September 1, 1899
Retro-choir looking East	September 8, 1899
Door from South Aisle to Retro-choir	September 8, 1899
Retro-choir, Altar and Sedilia	September 15, 1899
Carving on Berkeley Tomb	September 15, 1899
Entrance to Chapter-house	September 22, 1899
Chapter-house	September 29, 1899
Details Chapter-house	September 29, 1899
Plan	October 6, 1899
East Side Cloisters	October 6, 1899
From Road looking South-East	October 6, 1899

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Special Position Spaces.—Unless ordered for weekly insertions the Proprietors cannot guarantee particular dates.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 p.m. on Thursdays.*

COMPETITIONS OPEN.

Bournemouth.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

Ireland.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

Ireland.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

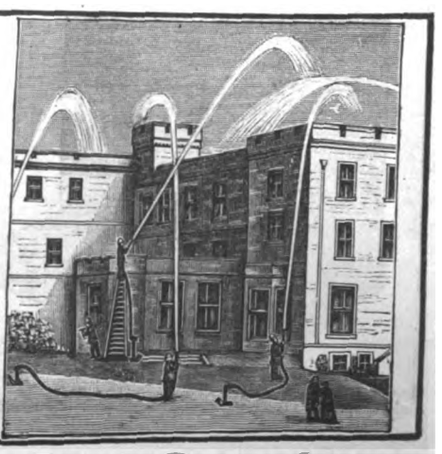
Manchester.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.



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Absolute Control of Heat.
Burns Continuously.
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Suitable for Bedrooms, small Offices, Parlours, etc. Most other places require the larger size, No. 3.


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Romford.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

Ruislip.—Nov. 15.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

Tingley.—Oct. 29.—The committee of the Tingley Working Men's Club and Institute, Tingley, West Ardsley, offer a prize of 5*l.* 5*s.* for the best accepted design for their new club premises, the plans to be for a club suitable for accommodating 300 members. Mr. Jno. Hawthorn, secretary, Booth's Buildings, Tingley, near Wakefield.

CONTRACTS OPEN.

Accrington.—Oct. 24.—For the reconstruction of business premises, Church Street and Holme Street, for Messrs. Williams (Accrington), Ltd. Contract No. 1, construction of the basement storey after clearing the site. Apply by Oct. 24 to Mr. Henry Ross, A.R.I.B.A., 15 Cannon Street, Accrington.

Appletreewick.—Oct. 29.—For the several works required in the erection of new conveniences, boundary walls, extension and forming of playgrounds, &c., at the Appletreewick Council school. Mr. B. Thornton, divisional clerk, Education Offices, Skipton.

Bacup and Rawtenstall.—Oct. 26.—For erection of secondary and technical school at Waterfoot. Plans and particulars on payment of 2*l.*, returnable. County Architect, Mr. Henry Littler, 16 Ribblesdale Place, Preston.

Baremuir (Buckie).—Oct. 24.—For the erection of a cottage hospital, for Rathven Parish Council. Mr. John W. Gordon, parish clerk, Buckie.

Beswick.—Oct. 29.—For the erection of the Gibbon Street Municipal school, Beswick, and Clarendon Road Municipal infant school, and alterations and additions to existing school, Crumpsall, for the Manchester Education Committee. Deposit 2*l.* 2*s.* Mr. Thomas Hudson, town clerk.

Bingley.—Oct. 24.—For new block at New Training College. Architect, County Hall, Wakefield.

Birkenhead.—Nov. 1.—For extension to nurses' home, also for conversion of probationary block into isolation wards, at the Union workhouse. Deposit 5*l.* 5*s.* Messrs. Edmund Kirby & Sons, architects, 5 Cook Street, Liverpool.

Bridgwater.—Oct. 25.—For contract (1) additional doorway and repairs to town hall; (2) exterior painting to town hall and municipal buildings; (3) exterior painting to premises adjoining above. The Borough Surveyor, Municipal Buildings, High Street.

Bude.—For the erection of a house at Bude, Cornwall. Send names to Messrs. Hatchard-Smith & Son, architects, 76 Watling Street, London, E.C.

Cannock.—Oct. 25.—For alterations and additions to the Council offices, Cannock. Messrs. Hickton & Farmer, architects, Bridge Street, Walsall. Bills of quantities supplied. Deposit 1*l.* 1*s.* Mr. C. A. Loxton, clerk to the Council, Council Offices, Cannock.

Coseley.—For putting in new floor, window, and other work at the Relief Office, Growcutt Street. Mr. Gaius W. Coster, clerk to the guardians, Union Offices, Dudley.

Doncaster.—For the re-erection of part of the headquarters of 5th Battalion King's Own Yorkshire Light Infantry. Mr. Albert E. Kirk, A.R.I.B.A., 63 Albion Street, Leeds.

Driffield.—Oct. 26.—For works required in the extension and alterations to the infirmary, laundry, and male bathing accommodation at the workhouse. Mr. Joseph Shepherdson, architect, 91 Middle Street South, Driffield.

Eastbourne.—Nov. 8.—For the erection of Eastbourne new post office. The Post Office, Eastbourne, or H.M. Office of Works, Storey's Gate, London, S.W.

Glasgow.—Oct. 29.—For the following works in the extension and additions to the administrative block and Avenue Home, Belvidere Hospital, and the cleaners' block, Ruchill Hospital, viz.:—(1) Digger, brick and mason works; (2) carpenter and joiner works; (3) plumber work; (4) slater work; (5) plaster work; (6) tile work; (7) heating work; (8) electric lighting and gas fitting work; and (9) painter work. The Office of Public Works, 64 Cochrane Street, Glasgow.

Glasgow.—Oct. 29.—For the following works required in connection with the proposed construction of the public convenience in Cathedral Square, viz.:—(1) Mason, brick, joiner, &c., works; and (2) sanitary fittings. The Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.

Grendon.—Oct. 31.—For the erection of an isolation hospital at Grendon, within the district of Atherstone, for the Atherstone Rural District Council. Deposit 2*l.* 2*s.* Mr. H. J. Coleby, engineer and surveyor, 102 Long Street, Atherstone.

Hales Owen.—Nov. 1.—For the extension of the Great Western Railway Co.'s goods office. The Engineer, G.W.R. Wolverhampton Station.

Ireland.—Oct. 26.—For building a public library at Enniskerry, for the Rathdown No. 2 Rural District Council. Deposit 5*s.* Mr. R. M. Butler, A.M.I.C.E., 12 Dawson Street, Dublin.

Ireland.—Oct. 31.—For rebuilding the bank premises, South Mall, Cork, for the Directors of the Munster and Leinster Bank. Mr. Arthur Hill, architect, 22 George Street, Cork.

Ireland.—Nov. 3.—For the erection of a metropolitan police barrack and station at Fitzgibbon Street. Deposit 1*l.* Mr. H. Williams, secretary, Office of Public Works, Dublin.

Isleworth.—Nov. 1.—The Brentford Guardians are prepared to receive tenders for alterations and additions to the heating and hot water service, the construction of subways, and additions to existing buildings, and the sinking of a well at their institutions, comprising the workhouse, infirmary and schools, all situate in Twickenham Road, Isleworth. Mr. E. R. Dolby, M.Inst.C.E. (Dolby & Williamson), 8 Princes Street, Westminster, S.W. The work is divided into three sections, viz.:—(1) General engineering work, (2) building work, (3) well and pumping plant. Deposit 3*l.* 3*s.* each section. Mr. William Stephens, clerk to the guardians, Union Offices, Isleworth, W.

Leeds.—Oct. 24.—For the bricklayer, mason, carpenter and joiner., plumber, plasterer, slater, and painter works required in the alterations and additions to the imbecile wards, at the Union Infirmary, Beckett Street. Messrs. J. M. Bottomley & Wellburn, architects, 13 Bond Street, Leeds.

Liverpool.—Oct. 27.—For the erection of Liverpool, Rice Lane, new sorting office. Mr. W. Gilruth, H.M. Office of Works, Head Post Office, Liverpool.

London.—Oct. 26.—For (1) supplying and fixing fanlight openers to certain windows at the Brook Fever Hospital, Shooter's Hill, Woolwich; and (2) repair and painting work to the shore buildings in connection with the training ship *Exmouth*, at Grays, Essex, for the Metropolitan Asylums Board. Deposit 1*l.* each. Mr. W. T. Hatch, engineer-in-chief, Office of the Board, Embankment, E.C.

London.—Oct. 26.—For erection of an addition to the steward's house at the cottage homes, Goldie Leigh, Plumstead, S.E., for the Guardians of Woolwich Union. Mr. Tom Cutter, clerk.

London.—Oct. 27.—For reconstruction of roofs over American and Babylonian Rooms at the British Museum, W.C. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

Maidenhead.—Oct. 29.—For small alterations and additions to the Church of England schools, East Street. Mr. Clifton R. Davy, architect, 86 High Street, Maidenhead.

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Manchester.—Oct. 30.—For the erection of new Labour Exchange, Manchester, for the Commissioners of H.M. Office of Works, &c., Storey's Gate, S.W.

Milford Haven.—Oct. 27.—For the erection of new buildings, and alterations to the existing buildings at the Council school, Milford Haven. Deposit 1*l.* 1*s.* Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest. Mr. Wm. Davies George, clerk to the Education Committee, County Education Offices, Haverfordwest.

Newcastle-upon-Tyne.—Oct. 26.—For the erection of the King Edward VII School of Art, Armstrong College. Send names and 2*l.* 2*s.* deposit by October 26 to Mr. W. H. Knowles, F.S.A., architect, 25 Collingwood Street, Newcastle.

Newcastle-upon-Tyne.—Oct. 24.—For the erection of twenty-five cottages on the East Denton Holdings. Send in names by Oct. 24, to the City Property Surveyor, Town Hall, Newcastle-upon-Tyne.

Normanton.—Oct. 24.—For the erection of thirty-eight houses for the working classes, on a site abutting upon Haw Hill Park. Mr. Arthur Hartley, architect and surveyor, Council Offices, Normanton.

Oldham.—Oct. 26.—For the construction of small store-room and conveniences in the Market Grounds. The Borough Surveyor's Office.

Purton.—Oct. 29.—For supplying and fixing an outside iron staircase, &c., at the workhouse. Mr. R. J. Beswick, M.S.A., 10 Victoria Road, Swindon.

Rochdale.—Oct. 26.—For construction of an oak screened vestibule to the Council chamber. The Borough Surveyor, Town Hall, Rochdale.

Stratford-on-Avon.—Oct. 25.—For the erection of detached and semi-detached houses in the Maidenhead Road. Deposit 1*l.* 1*s.* Mr. E. G. Holton, architect and surveyor, 58 Henley Street, Stratford-on-Avon.

Thornbury.—Nov. 1.—For the construction of a cattle market and contingent works at Streamleaze. Deposit 2*l.* 2*s.* Mr. T. B. Cooper, A.M.Inst.C.E., Sun Buildings, Clare Street, Bristol.

Thurnscoe. Nov. 3.—For the school enlargement (builder, joiner, slater, plasterer, painter). Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield. The Education Architect, Wakefield.

Tidworth.—Nov. 7.—The Secretary of State for War invites tenders for the following work:—The erection of two brigadier-generals' quarters, and four pairs of semi-detached officers' quarters (Group IV.), at Tidworth, Hants, in the Southern Command. Send 10*s.* by Oct. 28. The Director of Barrack Construction, 80 Pall Mall, London, S.W., or the Barrack Construction Office, Tidworth, Hants.

Treforest.—Oct. 29.—For the erection of twelve or more semi-detached villas at Forest Estate, Treforest, for the Forest Building Club. Messrs. Gibson, Parry Williams & Co., architects, Pontypridd.

Treherbert.—Oct. 24.—For the rebuilding of Soar Baptist Chapel, Treherbert. Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy.

Urmston.—Nov. 9.—For the erection of an elementary school at Urmston, near Manchester, to accommodate 400 children. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Wales.—Oct. 24.—For the erection of servants' quarters and other additions to their school buildings at Llandaff, for the Governors of Howell's Glamorgan County School. Mr. G E. Halliday, F.R.I.B.A., 19 Castle Street, Cardiff.

Wales.—Oct. 24.—For taking down old dome, and rebuilding to plan and specification, for the committee of the Workmen's Hall, Blaenavon. Mr. John Davies, secretary, The Institute, Blaenavon.

Wales.—Oct. 24.—For fixing a radial screw ventilator and taking down old ventilator off roof of Workmen's Hall, Blaenavon. Mr. John Davies, secretary.

Wales.—Oct. 29.—For building a house at St. Dogmells Road, Cardigan, for Captain Thomas. Mr. L. Lewis, architect and surveyor, Cardigan.

Woodchester.—Oct. 22.—For carrying out alterations and additions at Woodchester Endowed Church of England schools. Deposit 2*l.* 2*s.* Send names by Oct. 22. Mr. R. S. Phillips, architect, Gloucester.

Wilton (Wilts.).—Oct. 27.—For erection of iron fire-escape staircases and work in connection therewith to the men's and women's dormitories of the workhouse. Mr. Harding, architect, 58 High Street, Salisbury.

Withington.—Oct. 31.—For the erection of baths at Burton Road, Withington, for the Manchester Corporation. Deposit 3*l.* 3*s.* City Architect, Town Hall.

TENDERS.

BATH.

For the construction of brick culverts, together with pipe sewers, &c. Mr. W. H. Radford, C.E., Nottingham.

Wright & Co.	£11,734	5	2
Hayward & Worster	7,777	0	0
Hill & Co.	7,500	0	0
Strachan	7,200	0	0
Bentley & Son	6,186	14	0
Firth & Co. Derby (*accepted*)	5,251	12	3
H. H. Barry	4,991	0	0

BIRMINGHAM.

For alterations to houses in Great Colmore Street, for Mrs. Linda Browning. Messrs. W. H. Ward, architects, Paradise Street, Birmingham.

Taylor	£1,160	0	0
Green & Son	990	0	0
Surman & Son	912	0	0

CROSSGATES.

For erecting four semi-detached villas. Mr. Eric V. Wimpenny, architect, Leeds.

Accepted tenders.

Nettleton & Son, mason and bricklayer	£635	0	0
Bristow, joiner	363	0	0
Wood & Son, plumber	105	0	0
Blackburn, plasterer	85	0	0
Richmond, slater	69	0	0

HORNCHURCH.

For carrying out the Abbs Cross Road sewerage, for the Romford Rural District Council. Mr. William Fairley, C.E., 69 Victoria Street, Westminster, S.W.

Budden	£1,414	12	5
Pedrette	1,390	0	0
Jackson	1,321	4	0
Glenny	1,314	12	6
Wilson, Border & Co.	1,265	10	8
P. Wilson & Co.	1,185	0	0
White	1,160	19	3
W. & C. French, Buckhurst Hill (*accepted*)	1,156	13	11
Surveyor's estimate	1.500	0	0

HORTON.

For the erection of a hospital villa at Horton Asylum to accommodate fifty acute male patients, for the L.C.C.

Foster & Dicksee	£8,990	0	0
Holliday & Greenwood	8,750	0	0
F. & H. F. Higgs	8,700	0	0
Greenwood	8,647	0	0
Leslie & Co.	8,393	0	0
Carmichael	8,345	0	0
Johnson & Co.	8,320	0	0
Lawrance & Sons	8,137	0	0
Parker & Sons, Peckham (*accepted*)	7,931	0	0

LONDON.

For (1) the provision and fixing of an electric lift, and (2) the provision of a strong-room and the execution of structural alterations in connection with the fixing of the lift at 23 Belvedere Road, for the L.C.C.

Electric lift.

	Gear in basement, drum drive. Two openings to lift at ground floor.	Gear at top of well, drum drive Three openings to lift at ground floor.
Waygood & Co.	£352 10 0	£350 0 0
Smith, Major & Stevens	330 0 0	—
Medway's Safety Lift Co.	287 0 0	*£282 0 0
Architect's estimate		300 0 0

* Recommended.

Strong-room and structural work for lift.

Rowley Bros.	£750	0	0
Roberts & Co.	743	0	0
Leslie & Co.	735	0	0
Munday & Son	705	0	0
H. L. Holloway	687	0	0
Holloway Bros. (London)	677	0	0
J. & C. Bowyer, Upper Norwood (*recommended*)	645	0	0
Architect's estimate	650	0	0

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LONDON—*continued.*

For the reconstruction of Catford Bridge, carrying Catford Hill over the river Ravensbourne and the South-Eastern and Chatham Railway, for the L.C.C.

Kavanagh & Co.	£26,654 19 6
Pearson & Son	25,018 1 6
Pedrette	23,047 10 9
Thorne & Sons	22,057 4 10
Woodham & Son	21,181 7 8
Rowlingsons & Co.	20,923 2 0
Fasey & Son	20,920 5 8
Kirk & Randall	19,541 0 0
Pattison & Son	19,472 7 3
Jackson	19,433 16 3
Dick, Kerr & Co., Ltd.	19,391 4 9
Rigby	18,918 1 8
Mowlem & Co.	18,893 0 0
Muirhead & Co.	18,722 12 6
Clift Ford, Willesden Junction, N.W. (*recommended*)	17,989 0 0
The estimate of the Chief Engineer	22,000 0 0

For erection of a further portion of the Car-shed to provide accommodation for 16 additional cars at Hammersmith, for the L.C.C.

McManus	£2,494 10 10
Munday & Sons	2,448 0 0
Roberts & Co.	2,442 0 0
Lawrance & Sons	2,407 0 0
H. L. Holloway	2,387 0 0
Rowley Bros.	2,383 0 0
Leslie & Co.	2,375 0 0
J. & C. Bowyer	2,297 0 0
Charles Wall, Ltd., Lloyd's Avenue, E.C. (*recommended*)	2,280 0 0
Architect's estimate	2,350 0 0

For the erection of a police station and stable at Harrow Road. Mr. J. Dixon Butler, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W.

King & Sons	£21,324 0 0
Holland & Hannen	20,875 0 0
Jarvis & Sons	20,540 0 0
Higgs & Hill	20,533 0 0
Holloway Bros.	20,450 0 0
F. & H. Higgs	20,374 0 0
Killby & Gayford	20,353 0 0
Treasure & Sons	20,230 0 0
Patman & Fotheringham	20,123 0 0
Shurmur & Sons	20,121 0 0
Prestige & Co.	19,994 0 0
Sabey & Son	19,880 0 0
Willmott Bros.	19,853 0 0
Grover & Son	19,781 0 0
Fryer & Co.	19,771 0 0
Mowlem & Co.	19,755 0 0
Lovatt	19,745 0 0
Godson & Sons	19,691 0 0
Wallis & Co.	19,678 0 0

WALES.

For the alteration of the main road at Bedwas, Mon. Mr. William Tanner, F.S.I., county surveyor, Newport, Mon.

Bristow	£1,526 15 0
Sayers	1,158 16 9
G. L. Morgan	1,087 13 4
Denham	1,052 11 4
Parfitt	1,040 0 0
Leadbeter & Co.	1,020 0 0
McNab	998 10 0
Owen	965 11 9
Smith	955 0 0
Webb & Son	952 13 10
Pomery & Co.	947 0 0
Dix	939 5 0
Richards	936 1 1
Murray	918 0 11
Osmond Bros.	914 0 3
Monks & Co.	899 0 0
W. J. & W. F. Morgan	890 12 0
Rees	883 4 11
Sutherland	835 17 1
Barnes, Chaplin & Co.	831 16 2
J. B. Packer, Nelson (*accepted*)	770 13 9

WALES—*continued.*

For building a new school (accommodation 500) at Hendy, Pontardulais, for the Carmarthenshire County Council. Mr. W. Vincent Morgan, A.R.I.B.A., county architect.

Davies & Sons	£6,696 0 0
Mercer	6,295 0 0
Davies	5,993 0 0
Blake	5,900 0 0
Stephens, Bastow & Co., Bristol (*accepted*)	5,798 0 0
Architect's estimate	6,000 0 0

WALLSEND.

For the erection of public baths in Lawson Street. Messrs. Edwin F. W. Liddle and Percy L. Browne, joint architects, Newcastle-on-Tyne.

Hall	£9,088 0 0
Cleary & Charlton	8,950 0 0
Davidson & Miller	8,832 0 0
Foster	8,763 0 0
Lumsden	8,730 0 0
Pringle	8,686 0 0
Kennedy	8,608 0 0
Milne	8,555 0 0
Weatherley	8,547 0 0
Middlemiss Bros.	8,535 0 0
Peel	8,500 0 0
D. & J. Ranken	8,496 0 0
J. & W. Lowry	8,489 0 0
Weir	8,475 0 0
Craig & Son	8,405 0 0
George & Son	8,350 0 0
Fenwick & Co.	8,250 0 0
Oake & Co.	8,245 0 0
Haswell & Waugh	8,186 0 0
Sheriff & Sons	8,074 0 0
Franklin & Son, Newcastle-on-Tyne (*accepted*)	7,997 0 0

The London Master Builders' Association held special adjourned and ordinary Council meetings at the new offices, Koh-i-Noor House, Kingsway, W.C., on the 13th inst., under the presidency of Mr. Leonard Horner (president). A committee was appointed to confer with the Royal Institute of British Architects on the L.C.C. suggested building regulations *re* reinforced concrete construction. Legal matters relating to the new premises were considered.

The members of the Institution of Municipal Engineers held their second annual general meeting at Eastbourne on October 7 and 8. The latter date was devoted to an excursion to Newhaven for the purpose of paying a visit of inspection to the Newhaven works of the Sussex Portland Cement Company, Ltd., at the invitation of the directors. The party was conveyed in saloon carriages over the private siding of the Cement Company to the works. On arrival the visitors were received by Mr. J. F. Plaister, the managing director, Mr. A. J. Jack, J.P., another of the directors, and Mr. A. H. Double, the secretary. The guests having partaken of the luncheon provided by the company, Mr. Plaister proposed the health of the King, and proceeded to welcome the members of the Institute on behalf of the directors. He then went on to give a short account of the rise and growth of the company from the date of its incorporation twenty-six years ago, saying that the original works at Newhaven were designed for an output of 15,000 tons per annum, which output had been gradually increased until the present time, when the combined capacity of the company's works was equal to 100,000 tons per annum; and whereas the business of the company had originally been confined to supplying the Newhaven Harbour and other works in the immediate locality, "Newhaven" cement was now being used in all quarters of the globe. As one of the largest Sussex industries, the directors were delighted to do their share of entertaining the members of an Institution which only rarely held its meetings in the county, and at the same time they were glad to have the opportunity of showing that a cement could be produced in Sussex equal in every respect to the highest grade cements produced in other parts of the world. After dealing with several technical points connected with the uses of cement, Mr. Plaister gave a short epitome of the process of manufacture. A vote of thanks having been proposed by Mr. A. E. Prescott, the president, and seconded by Mr. J. T. Pegge, city surveyor, Durham, to the directors, the party proceeded round the works, when the processes of manufacture and testing were explained to them in detail.

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THE TOWN PLANNING CONFERENCE.

(*Continued from page 272.*)

Friday Afternoon.

The sitting on Friday afternoon in the Great Gallery was presided over by Lord Kitchener of Khartoum, when papers on the "Planning of Khartoum and Omdurman" and on the "Federal Capital of Australia" were submitted.

Lord Kitchener said he was very pleased to take the chair on such an occasion, but he regretted that Mr. McLean was not present in person to read the paper, which duty had been undertaken by Mr. Schultz, who had had the advantage of personal knowledge and association with Khartoum. Mr. Sulman was also unavoidably absent, and his paper would be read by Mr. John Slater. Mr. McLean's paper dealt with the story of the growth of the city of Khartoum and the policy pursued as regards its planning and development, a subject which was naturally of special interest to him. He well remembered the difficult problem that had to be determined after the conquest of the country, how best to evolve out of the ruined remains left by the dervishes a practical scheme for the reconstruction of Khartoum on sanitary lines, and it was a matter of gratification that the plans decided on had proved serviceable and had stood the test of time. It was also most satisfactory that they had been found to be in general accord with the principles of town development as laid down in the recent Town Planning Act of 1909—principles which it was the object of that Conference to popularise throughout the world. It was not easy for them to form a fair conception of the difficulties that had had to be overcome before a scheme of this sort could be carried out in the centre of Africa. First and foremost, careful consideration had to be given to the susceptibilities of a naturally uneducated Moslem population, to whom such ideas were absolutely foreign and to whose conservative minds most necessary modern regulations were repugnant. He believed he was correct in saying that no trouble on this account had arisen, and that the native population had agreed with the measures adopted, and now realised the fact that reasonable regulations meant increased length of life and increased prosperity. That in comparison with former conditions a revolution had been effected was beyond dispute. The old Khartoum was an African pest-house in which every tropical disease thrived and was rampant. Now malaria was almost unknown, though mosquito curtains were not in use, and last year there were only eleven cases of malaria in a town of 50,000 inhabitants. He did not think that such results had been achieved in any other British Dependency, and this excellent work did not stand alone in the Soudan, where sanitary conditions generally prevailed and demonstrated the thorough efficiency of the administration of the country. He could, of course, only claim to have sketched out the rough outlines of this scheme. The work itself had been carried into effect and adapted to varying conditions by his successor, Sir Reginald Wingate, who was not able to be with them that day owing to his recent return to duty in the Soudan. Let him recall a few of the names of the men who had been responsible for the new Khartoum. Most of them had been old comrades and brother officers of his own. The first names that occurred to him were those of Colonels Gorringe and Friend and Captain Kennedy; then that of Major Stanton, who as Governor of Khartoum for nearly ten years did so much for its development; and that of Colonel Drage, who performed the heavy task of carrying into effect the Land Acquisition Ordinance; and of Major Wilson, who succeeded Major Stanton as Governor. Perhaps as prominent a figure as any was that of Dr. Balfour, who had been long associated with the Gordon College Research, and whose name was a household word wherever tropical sanitation was discussed. He would also mention the names of Dr. Christopherson and two native officers—Bimbashi Ghuled Effendi and Yusbashi Mahammed Effendi Samaha. He said nothing of the Municipal Engineer, the author of the paper, who had had such a large share in recent developments, for his paper would speak for itself. Perhaps, however, he might mention what good work he was doing in lecturing on civil engineering at the Gordon College, an institution in which he felt sure they all took a lively interest. Much of the work involved in the preparation of the plans accompanying his paper had been done by the engineering students at the Gordon College, and he was delighted to see that their technical training was of no mere bookish kind, but was closely connected with practical utilities. In the second paper they would hear a good deal about the new Federal capital it had been decided to create in Australia. He recently visited the splendid cities of Sydney and Melbourne, and rather regretted that it had been found necessary to find another abode for the Commonwealth Parliament. Few cities in the world had ever started with such advantages of long preparation, and the result, they hoped, would be to make the capital of Australia when it was erected an example of all those principles which they were there to advocate, combined with magnificent buildings.

The Planning of Khartoum and Omdurman.

Mr. W. H. McLean, A.M.I.C.E. (Municipal Engineer of Khartoum), in the course of his paper dealt with the history of Khartoum and Omdurman and described the terrible state of affairs prior to the defeat of the Khalifa by Lord Kitchener in 1890. The photographs showed how a new and splendid city was being gradually converted from an unhealthy rabbit warren to an orderly town. At present the city extends along the bank of the Blue Nile for a distance of about two miles, and back from the river one mile. The existing municipal boundaries commence at the waterworks, and run, following the line of the old fortifications, to the White Nile, a length of about four and a half miles, the distance from the Blue Nile being about one and a quarter mile. All the land stretching away into the open desert to the south of the present city is also Government property, so that the future extension on proper lines is assured. The Sudanese native villages immediately to the south outside the old fortifications were built to accommodate the natives who had been living previously amid the ruins of old Khartoum. In this way an attempt was made to segregate the native population, a very desirable arrangement, more especially from a sanitary standpoint, as the epidemics to which all tropical cities are liable can be so much more easily dealt with. Omdurman is the real native town, while Khartoum is nominally the European one. The waterworks and electric-light station are situated on the extreme east boundary near the river bank, while the sewage farm and refuse-destructor are to the south-west of the town beyond the old fortifications, as shown on the map. At Khartoum North the Government dockyard, stores, and some of the Egyptian Army barracks are located. There is also a large native town here, which has been laid off on a distinct plan in the same manner as the villages to the south of Khartoum. The general scheme on which the town has developed was initiated by Lord Kitchener before he left the Sudan, and the most striking feature of the plan is the diagonal streets, which appear to have been introduced primarily for military purposes. Each crossing of these diagonals commands a considerable portion of the city. The diagonal streets are undoubtedly a useful direct communication between various points, but at the crossings they form awkward building plots, which are somewhat inconvenient in the business quarter of the town. The bridge across the Blue Nile was completed recently, and the railway has now been carried round to the Moghran Quay at the west end of the town. The railway embankment has reclaimed the land to the east of it, which was liable to flooding at extreme high Nile. There are level crossings over the railway on all the main routes to the city. Running parallel to the embankment are three main avenues, named Khedive Avenue, Abbas Avenue, and Sultan Avenue, while at right angles to the river there are four—namely, Kitchener Avenue, Melik Avenue, Victoria Avenue, and Mohamed Ali Avenue. The general scheme of planning is that the main avenues running parallel to the river intersect those running at right angles, forming rectangles approximately 500 yards square. These rectangles are sub-divided by three streets running each way parallel to the main avenues, and by the diagonal streets connecting the intersections of the main avenues. With the laying out of the Government land to the north of Khedive Avenue there was not quite such a free hand, owing to the desirability of utilising and preserving what remained of the principal buildings and gardens of old Khartoum, and this accounts to some extent for the want of symmetry in the plan. The palm groves in the gardens form one of the most attractive features of the city. Victoria Avenue, the most important, is 180 feet in width and is centred on the Palace, from which there is a most striking vista away to the south, with the luxurious gardens in the foreground. Khedive Avenue, running at right angles, is next in importance, being 150 feet wide. The Gordon Statue is at the crossing of these two principal avenues. The main streets are 120 feet and the secondary streets 80 feet wide over all, and many of the plots in the third-class or native quarter of the city have lanes 12 feet wide running through them, made prin-

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cipally for conservancy purposes. Fifteen feet of the width of all footpaths is contributed by the owners of the abutting properties, who are permitted, however, to build arcades over this portion. The streets and avenues are named on the following system, which has proved a satisfactory one. All streets running parallel to the river are known by odd numbers, the embankment being "First Street," and all streets at right angles to the river are known by even numbers, beginning at the east end of the city with "No. 2 Street." The principal streets and avenues have special names in addition. The diagonal streets are named after the more important battles fought in the country—*i.e.* "Atbara Street." Khedive Avenue is the largest type of avenues and streets, in which the footpaths each occupy about one-third of the total width, and along each footpath two rows of trees are planted. The Embankment is of a similar type, but the footpath widths vary considerably, owing to the irregularity of building line and the river embankment, where there is no retaining wall or other protective work. Thirteenth Street (Abbas Avenue) is the main-street type, with 30-feet footpaths, half of which may be covered with an arcade. Seventh Street is the type in the business part of the city. Owing to the expense which would be involved in constructing and maintaining such an enormous area of street surface, only the middle third of main avenues and streets are macadamised at present. The side portions form soft "going" for horses, while the vehicular traffic takes the centre. In the business part of the town the whole width is, of course, macadamised. Curbstones are laid in some of the principal avenues and streets, but the footpaths are merely made up with earth, except where proprietors have constructed tiled or other pavement in front of their premises. Meantime only a few of the main avenues and streets are macadamised, but the work is being pushed forward as funds become available. A certain amount of open space has been reserved. Abbas Square, in the centre of the city, is about 800 yards long and 200 yards wide. In it stands the great Mosque, a most impressive building There are public gardens near the Gordon Statue and on the river embankment at the west end of the city, where there is also a zoological collection. The markets are on the north side of Abbas Square, and there is ample space reserved for extension. In the native quarter there are large markets, principally for grain and firewood. For the purpose of allotting land for buildings the city was, in the first instance, divided into quarters, and to ensure some uniformity in the class of buildings to be erected there was specified in the regulations issued the minimum value of the building and the class of material to be used in its construction. Latterly it has become necessary to provide for a greater control in the detail of the building operations, and recently a simple set of detailed regulations, adapted to the use of the country, were issued. These have worked in a very satisfactory manner, and the inhabitants appear to look upon them as a guarantee against the practices of the "jerry builder." The types of buildings vary considerably, but the flat roof is almost universal in Khartoum. In dwelling houses they are convenient for sleeping on, but during the rains are a source of trouble, as it seems practically impossible to keep them quite watertight. In a paper on "Dwelling-houses in the Tropics," contributed by the author to the recent Wellcome Research Laboratories Report, it is shown that for white men an excess of tropical light is injurious and must be guarded against. Houses for such men should be well darkened and have low verandahs, the rooms being arranged so that each gets a share of the prevailing wind. Colours are all-important in the tropics, and houses painted white should not be permitted in cities, as the glare from them is terrible. The greens, dark yellows, and browns, to which our eyes are adjusted, are preferable. But for the damaging effect of rain, mud walls are quite satisfactory, and they certainly have the advantage in that they do not retain and radiate the heat like stone or brick walls. The waterworks and electric-light station, constructed by the Public Works Department, under the direction of Captain M. R. Kennedy, R.E., are situated at the extreme east boundary of the town. There is no system of sewerage, and the waste water is dealt with by "broad irrigation" in the gardens where available, or it is run into "percolation" pits or into "waste-water" pits, from which it is daily removed in carts. During the rains a system of shallow trenches is cut as recommended by Mr. C. E. Dupuis. The trenches follow the less important streets just outside the pavement line. They cross all main avenues in steel pipes, and, being below extreme high Nile level, require to be pumped out if rains occur during that period. The dry-closet system is adopted, and there is a house-to-house collection, the soil-pails being taken out to the sewage farm and there dealt with. Kitchen refuse is taken to the destructor at the sewage farm and burnt. The systems, which were inaugurated by Dr. Balfour, Medical Officer of Health, are working extremely satisfactorily. There are public latrines and urinals throughout the city. The Anglican cathedral is in course of erection—close to the spot where Gordon fell. The building is unique in style, and has been specially designed by Mr. R. Weir Schultz to meet the requirements of a tropical climate, the main feature, from a constructional point of view, being the external ambulatory, which is introduced for coolness. Mr. McLean also described the work being undertaken to reconstruct the native city of Omdurman.

Discussion.

Major Stanton, who exhibited a number of photographs showing the present condition of Khartoum, said he had been quoted as having said that Khartoum would become the largest city in Africa. He would rather like to alter that to one of the largest towns. It might be fifty or a hundred years, but ultimately the city would be as big as Cairo or Alexandria both in population and prosperity. He included in the city Khartoum North and Omdurman, and together they already had a population of over 100,000. He did not think the extent of the Soudan was realised in England, but it covered one million square miles. It was true that a large extent of the country was, as the late Lord Salisbury once remarked, "somewhat like soil," but there were large areas which only required irrigation to become splendid agricultural lands. There was a district of 9,000,000 acres between the White and Blue Nile which only required water to become one of the finest cotton fields the world could produce. He agreed that at present there was insufficient business and life in Khartoum. He had heard the width of the streets criticised, but those who had had to live in the country in April, May, June, and July knew that the temperature was often 150 degrees, and the heat radiating from the walls could be felt at night ten to twelve feet away. Therefore it was absolutely necessary that the streets should be of a sufficient width to allow of cool passage. Major Stanton referred to the extraordinary way in which the trees grew, and by photographs showed how trees planted by Lord Kitchener from pots eight years ago were now thirty feet high and two feet in diameter. Khartoum owed both its plan and its prosperity to Lord Kitchener, and future generations would be as proud of its appearance as they to-day were proud of the great soldier who died there (General Gordon) and the still greater soldier who had taken its name for his title and to whom it owed so much.

Colonel Plunkett said that in mediæval Cairo there were many streets and houses which were peculiarly well suited for the climate and were beautiful in every way, whereas in the new quarter of Cairo the houses were not only ugly, but were absolutely unsuited for the climate. It was gratifying to see that they were building houses in Khartoum which would be suitable for the climate. As to the interior of the houses, he knew that was a very difficult matter for the Government to interfere with, but they might perhaps exercise an indirect influence in that direction. In the old houses of Cairo they found marble floors and fountains, making them cool and pleasant and in every way beautiful. He hoped that all the influence possible would be brought to bear on those traders in Khartoum who would become rich in the future to make their houses suitable and beautiful, and to take as models the houses in Cairo of two or three centuries ago, instead of trying as they now did to copy everything European and making their interiors a third-rate copy of a very third-rate Mediterranean town.

A delegate said that in the heart of Central Africa had been evolved a beautiful city, and the moral was that what was possible in Darkest Africa should be possible in Darkest England. They ought, after hearing the paper, to go forth inspired to carry on the good work.

Mr. Schultz said Mr. McLean had referred to mud walls. In England they had had walls of clay and chalk, but the bye-laws now made it almost impossible to erect cottages with the simple and economical material at hand, and the result was that in many parts the country was being disfigured by ugly brick cottages which did not harmonise with the landscape, whereas they had material at hand which would harmonise with the landscape and the old buildings around. It was a curious fact that, whilst mud was used in tropical countries to keep out the heat, it was used in this country to keep out the cold. The cottages in Devonshire built of blocks of clay were most comfortable, being cool in

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summer and warm in winter. They were covered with two or three coats of lime-wash, which acted well in preventing moisture penetrating the walls. He thought the Conference ought to make a clear protest against the unnecessarily restrictive bye-laws. Although the President of the Local Government Board was always saying he was ready to help them, and did do a great deal, yet, being associated with a society which had for its object the improvement of the bye-laws, he (the speaker) knew how difficult it was to get anything through. There were all sorts of difficulties thrown in the way, and that Conference ought to make some definite protest against the bye-laws and see if anything could be done to alter them so that they might be interpreted in a common sense and reasonable way. The cost of building was going up every year, and yet they could build economically and satisfactorily if they were allowed to do so.

Mr. Bernard Gibson asked what the trees were which had grown so splendidly in Khartoum.

Lord Kitchener said they were acacias and also ordinary gum trees.

The Federal Capital of Australia.

Owing to the lateness of the hour it was decided to take Mr. Sulman's paper as read.

Mr. J. Sulman, F.R.I.B.A. (Consulting Architect, Sydney, New South Wales), having described the steps which led to the choosing of a new site for the Federal Capital, said he did not think Australians realise as yet the unique opportunity that is thus presented to them of planning a fine city *ab initio*, and at first there was a possibility that it might drift into the hands of permanent officials whose knowledge of city planning and its possibilities was conspicuous by its absence. Realising that the subject of conscious city planning is comparatively new in Australia, and that it is not likely the best result would be attained by local effort owing to lack of experience, he had strenuously advocated throwing open the planning of the Federal Capital to worldwide competition, and it is gratifying to know that the late Deakin-Cook Government had decided to adopt this course. A complete contour survey of the chosen site has been prepared, levels have been taken for drainage, the site of an irrigation sewage farm determined upon, and sufficient territory acquired to ensure ample water supply. The data necessary for competitors is in course of compilation, and it only now remains to be seen whether the present Government will carry out the expressed intentions of its predecessor. Believing that it will be favourable, he thought that it might be useful to his *confrères*, who may be intending to compete, if he gave some idea of the special conditions that will have to be met.

Australia has its own distinguishing characteristics, climatic, political, racial, social, and constructive, that differentiate it from any other country in the world. Because we are almost entirely of Brito-Irish descent it must not be assumed that "Home" ideas and traditions are necessarily current. Nor can we be classed as similar to the other Dominions of the Empire, and still less are we in harmony with the ideas of other nations. We are just ourselves, and though a young nation, have developed our own idiosyncrasies very rapidly, owing to our isolation from the rest of the world.

The chosen site of the Federal Capital is at Canberra, between the towns of Queanbeyan and Yass, in the State of New South Wales. It is situated appropriately enough on the broad backbone of the continent, a range of hills or mountains that stretches from Cape York in the extreme north, more or less parallel to the eastern and southern coasts till it sinks down into the plains in the vicinity of Adelaide. Its average height is only about 4,000 feet, and nowhere does it rise much above 7,000 feet, so that compared with other countries Australia is decidedly flat. Its whole interior is a vast slightly rolling plain. The actual site of the capital is barely 2,000 feet above the sea, on a narrow rolling plain surrounded by hills and ranges of moderate elevation. The plain slopes down to the Molonglo River, a small stream which falls into the Murrumbidgee, an important branch of the main river system of Australia. Within a mile or two of the site a position has been selected for a weir on the Molonglo, above which it would be turned into an artificial lake, an asset in city planning of the utmost value. About thirty-five miles away the Murrumbidgee itself is being dammed at Barren Jack, and an enormous body of water will be impounded, second only in extent and volume to the Nile above Assouan. It is intended for irrigation of the rich plains of the Riverina district of New South Wales, and although of no practical value to the Federal Capital it will be a source of delight to all visitors and residents.

The ranges above referred to approach each other within about three miles just where the city is to be located. On the south-west a bold hill called the Black Mountain is prominent, while to the north-east Mount Ainslie rears its conical mass high into the air. It rises about 800 feet above the plain, and from its summit a most glorious panorama of the whole range of the southern mountains unfolds itself; even down on the level fine views may be obtained, and they should be carefully taken into account and utilised in the planning of the city.

The outstanding feature of the Australian climate is its abundant sunshine and clear atmosphere. During three months in summer the heat is considerable, and shade, therefore, would be grateful; but owing to its elevation the nights would always be comparatively cool. In winter the south and west winds are very cutting, and shelter therefrom of very great importance. The nearest approach to these conditions in European countries may be found in the Tuscan portion of Italy or on some of the lower plateaus of Southern Spain.

As regards political considerations, it must be carefully borne in mind that the Australian Government is one of the most democratic in the world. Hence there need be no special segregation of official buildings, but only such ordered grouping as will facilitate administration. But this does not indicate that anything like meanness in structures or surroundings is countenanced or desired. On the contrary, our public buildings are more important in comparison with population than they are in Britain. In providing for the Governor-General, the representative of the Empire, the above considerations do not apply. He is, and should be, provided for in a generous way, in harmony with his previous life and surroundings.

Social life is also much more free and unconventional than that of Europe, owing, perhaps, to the more equal diffusion of wealth. Generally diffused prosperity, shorter hours of labour, and a genial climate naturally encourage outdoor amusements, in which sport in all its forms takes the predominant place. Hence a racecourse, sports grounds for cricket, football, and other games, running-tracks, swimming-pools, rowing-courses, &c., are an absolute essential to a representative Australian city. Drill-grounds for the proposed citizen forces based on universal service will also be needed. Quite apart from these an ample supply of parks should be provided. As to dwellings, the Australian, of whatever degree, generally prefers what we call "a cottage." That is to say, a one-story building, however large it may be. In England it is known as the bungalow type. "A house" with us is a building of two stories, however small its capacity.

In a pastoral and agricultural country like Australia another important feature of every city and town is the "show ground," where all kinds of live stock and produce, as well as implements and machinery, may be exhibited at least annually. The more serious side of life must, of course, be provided for, and ample provision made for school buildings, large playgrounds, and school gardens. Possibly even a university may be needed in the future, and undoubtedly a high school for secondary education and a technical school for training in the arts and trades. Sites for public halls, institutes (schools of art they are called here), meeting halls for trades organisations and friendly societies, and for the churches of all denominations should also be set apart in appropriate positions, but they should one and all be ample in size to allow of present beautification by trees and shrubs and future expansion. A site for one theatre may be reserved. During the session a large floating population must be provided for by hotels or boarding houses (pensions). The permanent population will consist mainly of officials and the traders, &c., who will supply their wants and the workers engaged in actual construction. The Federal Capital is never likely to become a manufacturing city, as it possesses neither a coalfield nor sufficient water to generate more power than will be required for tramways and lighting. But a space should be set apart for the storing and easy handling of building materials and the goods and produce that are needed in daily life. These will come by railway, on a branch line connecting Yass and Queanbeyan, with a possible extension to the sea at Jervis Bay.

Possessing many attractions in the way of climate and scenery, and being the headquarters of the Governor-General, it is probable that the capital will gradually attract a permanent population, as Washington has done. What its ultimate size may be no one can tell, but his impression is that for many years to come it will not exceed 50,000, while it may grow in course of time to 100,000. Any possible increase beyond that number is, he thought, so far in the future that we may leave later generations to deal with the problem.

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DISCUSSION.

Mr. JOHN MITCHELL (New Zealand) said he believed the Conference would be of immense service, not only to the Australian Colonies, but to the whole British Empire and the civilised world. If time permitted he could have given many illustrations of the good things they had done in Australia and New Zealand, and also make free confession of the failures they had made by reason of the shortcomings of human nature and the very nature of things arising from the quick evolution of a new city. He could, however, say with confidence that the ideal to some extent of the soldier, the ideal of the engineer, the ideal of the artist, the ideal of the architect and also of the health officer, were not being overlooked in Australia.

A vote of thanks was accorded to the authors of the papers on the proposition of LORD KITCHENER, and a cordial vote of thanks was passed to the Chairman on the motion of Mr. LEONARD STOKES.

The East Gallery.

The size of the audience at the final meeting in the smaller gallery was doubtless affected by the presence in the adjoining hall of Lord Kitchener. The chair was occupied by Mr. F. G. PAINTER, F.C.A., Chairman of the City Lands Committee. Two papers were mentioned on the programme: (1) "A Suggestion for the Treatment of Trafalgar Square," by Mr. H. H. Statham, F.R.I.B.A., and (2) "Town Planning in relation to old and congested areas," by Mr. Arthur Cross, F.R.I.B.A. Mr. Statham, however, did not appear. His place was taken by Mr. W. Woodward, F.R.I.B.A., who briefly described his own scheme for

The Remodelling of Trafalgar Square.

The subject of rebuilding Trafalgar Square had, said Mr. WOODWARD, been before the public for very many years. He himself had taken a personal interest in it for twenty-five years. Included in the question was the existing disgraceful state of things on the south side, where, in consequence of a difference of opinion between the authorities, the arched entrance designed by Sir Aston Webb to lead up to the Victoria Memorial and Buckingham Palace is allowed to be hidden. Such an occurrence could not prevail in any other country than England, where the Government will not put its hands into its pocket for any sort of public improvement.

Mr. Woodward's main suggestion for the remodelling of the Square consisted in the removal of the two corner staircases leading from the terrace on the north side. They would be replaced by a large central staircase of about the same breadth as the portico of the National Gallery, and with the lines of which it would harmonise. The present so-called fountains or squirts would also be removed, and in their stead would be set fountains of better design, and with a profusion of jets of water, such as occur at Versailles. The asphalte floor surface would be replaced by marble paving, as on the Piazza of St. Mark's. The Square should be made to represent the naval history of the country, the existing military statues being removed to St. James's Park, which might in its turn become the military monumental centre. Each side of the staircase leading from the terrace would have bronze sculptured panels, showing naval incidents, and especially of individual gallantries, like John Davis forcing the North-West Passage, Sir Richard Grenville and the *Revenge*, Raleigh's offer to King James, or the Death of Blake. On the two main piers allegorical figures standing on gilded globes might be placed, one representing "Peace" and the other "Honour." At the four corners of the Square there could be set up sculptural groups depicting the naval victories of the sixteenth, seventeenth and eighteenth centuries—Trafalgar being the culminating point in 1805. The present Nelson Column is left untouched. The larger piers on the east and west walls would support minor groups, and the smaller ones electric lamp standards—the intervening spaces being filled in with gilded wrought-iron railings. As the present entrance to the Tube station in the south-east corner could not be removed, it might be made more in harmony by erecting over it an open wrought-iron dome. To counterbalance it a similar dome over a fountain should be set up in the south-west corner. Shrubs would add still more to the general effect if they could be introduced without destroying "the people's forum." Mr. Woodward mentioned that his scheme was at present under consideration as a possible memorial to the late King Edward. He could only hope that something would be done according to one or other of the different schemes put forward to enhance Trafalgar Square.

London's Congested Areas.

Under the title of "Town Planning in Relation to Old and Congested Areas, with Special Reference to London," Mr. ARTHUR CROW, F.R.I.B.A., District Surveyor for Whitechapel, &c., gave an illustrated paper.

After referring to the existing evils, he said the measures necessary to remedy congestion in Central London would seem to fall naturally under three heads, viz.:—(1) To facilitate the transit of goods; (2) to facilitate the transit of people; (3) to secure the health of the people.

In considering the problem as applicable to London the survey cannot be confined within the restricted limits of the present county boundary, which includes an area of 116 square miles and a population of 4,613,812. The area could be approximately fixed by a circle having a radius of 25 miles from the Mansion House, which might be sufficient for the needs of London to the end of the present century. The area would be nearly 2,000 square miles, and would accommodate thirty million people on the basis of twenty-five persons to the acre.

The Royal Commission on London Traffic, 1903, dealt with the area known as "Greater London," comprising that of the City of London and the Metropolitan Police District, containing nearly 700 square miles, with a population in 1901 of 6,581,402.

The population of "Greater London" during the last century doubled itself every forty years. The Commission estimated that in 1931 the population of "Greater London" would be "not much short of eleven millions." If the same rate of increase be maintained the population of this area in 1941 would be about thirteen millions. A population of this magnitude, living under proper conditions of health, would require an area of about 850 square miles, allowing twenty-five persons to the acre and making provision for open spaces, roads, &c.

From statistics prepared by the London County Council it appears that the population per acre in the central area of London is 148, in the rest of the county 54, in districts adjacent to the county 16.6, and in the rest of "Extra London" 2.5.

It would probably, however, never be possible to reduce the present excess of population to the limits of the standard laid down. That being so, it would seem that the logical course to pursue would be to afford special facilities for conveying the people to a distance considerably outside the area already covered, thus leaving an intervening space of uncovered land to rectify, as far as possible, the excess of population in the central area.

Dealing first with main avenues for the transit of goods and for general business purposes, it is clear that provision must be made for a frequent service of trams and motor-buses. The width should not be less than 100 feet between the buildings. These thoroughfares will partake of the nature of boulevards, with trees and seats. Secondary business thoroughfares, where trams are again provided, could be reduced to 80 feet. In subsidiary streets, where no trams are required, the width could be further reduced to 60 feet, the footways being reduced from 12 feet to 10 feet.

Coming to the question of avenues for the transit of the people from town to suburb, it is doubtful if in any case they should be laid out of a less width than 100 or 120 feet, and in the case of a main central artery a greater width should be provided. From this central avenue would branch the great trunk roads leading to the suburbs eight, ten, or twelve miles distant.

These trunk roads would be formed in some cases by widening existing main roads. In other cases existing roads might be utilised for some distance, and then new extensions made through the open country.

In order to supplement these lines of egress from the Metropolis it is suggested to provide a series of radiating tubes and sub-surface railways from the City, having stations situate at a distance of one and two miles respectively from the central station. These lines would extend, say, fourteen miles from the centre, and would have no intermediate stations except those just referred to. A straight run of twelve miles without a stop would thus be afforded, and, with the advent of the mono-rail, there is no reason why the whole distance (fourteen miles) could not be covered in fifteen minutes. For a distance of four or five miles and until the open country was reached these lines would be constructed in tubes in the London Clay. They might then rise by easy gradients, and be continued to their destination in open cuttings.

The termini of these lines, falling on the circumference of a circle some twenty-eight miles in diameter, would con-

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stitute the centres of ten new areas, forming in due time cities of health.

The development of these cities of health would proceed on clearly defined lines. The area of each would be comprised within a circle some seven miles in diameter. The whole would form part of the enlarged County of London, whilst for purely local purposes each might come within the area of an existing authority within or near its boundary on the north side of the river. The area of each would be approximately about 25,000 acres. Allowing one-fifth of this for roads and open spaces, and limiting the number of persons per acre to twenty-five, provision would be made in each city for housing about half a million persons.

To remedy the existing evils the following outline scheme was suggested:—

A Traffic Authority to be appointed by Parliament:—

1. To determine from time to time as to the position, width, and direction of new thoroughfares required.

2. To consider the extent to which it is necessary to widen existing streets, and to arrange for their proper classification into grades, determining in each case the position of the future building lines.

3. To consider the height to which buildings should be allowed to be erected in each of the respective grades.

The Traffic Authority to make an annual report to Parliament, setting forth the result of their deliberations as to

(*a*) Projected thoroughfares.
(*b*) Streets graded.
(*c*) Building lines determined.

Upon the report of the Traffic Authority Parliament to embody the same in an Act.

A suggested scheme of street improvements for part of the Metropolis north of the Thames was indicated by Mr. Crow on the six-inch Ordnance Survey so far as regards the main traffic routes.

The most important of the thoroughfares is the main artery, in the form of a double avenue with central boulevard, extending across the present county from the iron bridge over the Lea at Canning Town in the east to Shepherd's Bush Green in the west, a distance of about ten miles. The width between the buildings is proposed to be 225 feet, allowing 75 feet for each avenue and 75 feet for the boulevard.

The route chosen for this avenue lies mainly through the most congested districts, and in the eastern portion for a length of four miles through the poorest parts of Poplar, Bromley, Limehouse, Mile End, Whitechapel, Spitalfields, and Shoreditch.

There would appear to be no reason why the projected thoroughfares should not be the subject of immediate legislation, to prevent the erection of costly buildings on land which would have to be subsequently acquired for the improvement.

The cost of some of the improvements would doubtless be heavy, but as such an artery will last for ever so should the time allowed for repayment of loans be of sufficient duration to avoid an undue burden on the present generation.

With regard to the ten cities of health, tentatively two might be laid out with a reasonable prospect of success. The cost of each city, with its connecting tube, would be approximately about 10,000,000*l*., including 2,000,000*l*. for the purchase of sixty-three square miles of land (nine miles diameter) at 50*l*. per acre; 3,648,000*l*. for the development of thirty-eight square miles (seven miles diameter) at 150*l*. per acre; 4,200,000*l*. for the construction of the tube and subsurface railway (fourteen miles at 300,000*l*. per mile). This outlay would be returned twofold by the sale of the developed land at the average rate of 1,000*l*. per acre.

It is open to consideration, however, whether it would not be better to sell the land in bulk to co-partnership societies at a price which would recoup the outlay, giving the tenants the advantage of moderate rents.

Alderman Fildes remarked that in a good many of the papers read before the Conference there had been too much attention paid to theory, and not enough to the practical side of town planning. The splendid paper by Mr. Crow was conspicuous for the fact that it dealt with the congested area of London, while the other papers had treated of the outskirts. Obviously if the improved housing of the working classes was to be effected they must, in considering the outskirts, consider the congested parts also. In every such scheme the vexed question arose "Who is going to pay the cost?" Everyone would like to see the fine schemes realised. But the ratepayer is already heavily burdened, and unless care is exercised he will be taxed out of existence. Consequently they ought to put the pretty schemes on one side for the present, so as to carry out the most pressing practical ones.

Another speaker said that at Manchester they had taken in hand the slum quarters, not by pulling down the dwellings at an enormous cost, but by altering and renovating them so that they would be kept going for a further twenty years until the town planning scheme is ready. During five years 8,400 houses have been altered, at practically no cost, because orders were, when necessary, obtained against the owners. This means that suitable habitations have been found for 40,000 people.

Mr. F. G. Painter spoke from the chair on the shortcomings of the present Building Acts. The meeting closed with a vote of thanks to the chairman.

VARIETIES.

Barrow Council are preparing a scheme for town planning in the neighbourhood of Barrow public park, to be submitted for approval to the Local Government Board.

Mr. John Thomas Christopher, F.R.I.B.A., aged eighty, of 19 Marloes Road, Kensington, left estate valued at 15,126*l*.

Messrs. Kinnear & Mordie, contractors, Glasgow, have received the contract for the construction of a ferro-concrete bridge at Waterford over the river Suir. The work will cost 71,000*l*.

The *Feuille Fédérale Suisse* of October 5 publishes a decree granting to the Federal Council, Switzerland, the sum of 135,400*l*. for the construction of a post, telegraph and telephone office at St. Gall, Switzerland. About 2,000*l*. is to be devoted to the purchase of the site, and the remainder to the construction of the building and of a tunnel connecting the post office with the State railway line.

The Clydebank Dean of Guild Court have just passed plans for the erection of a new model lodging-house in Macarthur Street, Yoker. The building is to be of four storeys, and will have accommodation for 372 men in separate cubicles. It will be fireproof throughout, the cubicles being made on a new system with asbestos and steel. The total cost is estimated at 12,000*l*.

Invitations have been issued to a large number of representatives of working men's associations round London and in the neighbouring counties to inspect the town planning exhibits in the Royal Academy galleries on Saturday afternoon, October 22, at 2 p.m. The President of the Royal Institute of British Architects will welcome the meeting (for which arrangements have been made by Mr. Aldridge), and address it briefly on the subject of the exhibition, especially in relation to the interests of the industrial classes as householders and ratepayers.

The new system of lighting Victoria Street by high-pressure gas lamps has now been completed, and the Westminster City Council are to be congratulated on the result. The many thousands of visitors to London who arrive at the Victoria Stations cannot fail to receive a favourable impression of the Metropolis if their first experience is to be driven along Victoria Street after dark—or rather after sundown—for the new lamps, each of 2,000 candle-power, have entirely banished darkness. When the installation of modern gas lamps has been completed in Regent Street, Pall Mall, Piccadilly Circus, and Shaftesbury Avenue, London will make a far better comparison with Berlin and Paris in the matter of street lighting than ever before. The Westminster City Council cannot extend their improvements to all their West End thoroughfares. Owing to a thirty years' contract electric arc lamps will continue to be used in the district of St. George's, Hanover Square.

The University of London have arranged for a course of five lectures on "Reinforced Concrete" to be given at the Institution of Civil Engineers, Great George Street, Westminster, S.W., by permission of the Institution, by Mr. W. Dunn, at 5.45 p.m., on November 4, 11, 18, 25, and 30. The chair at the inaugural lecture will be taken by Sir Henry Tanner, I.S.O., F.R.I.B.A. The syllabus is as follows:—On patents—concrete for various purposes—columns and compression members—longitudinal reinforcement—lateral reinforcement in various forms—column footings and other details—on beams and reinforcement to resist bending—labour-saving tables—shearing and shearing reinforcement—retaining walls—dock walls and jetties—bridges—girder bridges—arch bridges—failures in reinforced concrete—quantities and cost data, &c. In addition to the lectures, a demonstration will be given at University College, showing the manner of failure of reinforced concrete columns and beams in the testing machines. The lectures are addressed to advanced students of the University and others interested in the subject. Admission will be by ticket, obtainable from Mr. P. J. Hartog, Academic Registrar.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

Special Position Spaces.—Unless ordered for weekly insertions the Proprietors cannot guarantee particular dates.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

Bournemouth.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

Ireland.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

Ireland.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

Ireland.—The Committee having charge of the building of the proposed Church House and Synod Hall at Armagh, to be erected adjoining the Cathedral, invite correspondence from competent architects with a view to the preparation of plans. Rev. C. K. Irwin, B.D., Hon. Sec., Brantry Glebe, Dungannon, Co. Tyrone.


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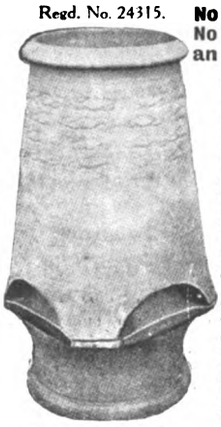
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Isle of Man.—Dec. 14.—The owners of the Villa Marina, Douglas, invite designs for pavilion and laying out pleasure gardens, &c., at a cost of 16,000*l.* One award of 200*l.* and two of 100*l.* will be made, the design becoming the absolute property of the landowners. Send 1*l.* 1*s.* deposit to Mr. Alexander Robertson, Town Clerk, Town Hall, Douglas.

Manchester.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

Romford.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

Ruislip.—Nov. 30.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

CONTRACTS OPEN.

Appletreewick.—Oct. 29.—For the several works required in the erection of new conveniences, boundary walls, extension and forming of playgrounds, &c., at the Appletreewick Council school. Mr. B. Thornton, divisional clerk, Education Offices, Skipton.

Belfast.—Nov. 1.—For the erection of baths at Legoniel. The City Surveyor, City Hall, Belfast. Send 2*l.* 2*s.* deposit to the City Chamberlain, City Hall, Belfast.

Birkenhead.—Nov. 1.—For extension to nurses' home, also for conversion of probationary block into isolation wards, at the Union workhouse. Deposit 5*l.* 5*s.* Messrs. Edmund Kirby & Sons, architects, 5 Cook Street, Liverpool.

Bradford.—Nov. 7.—For the various works (steel work excepted) required in pulling down, altering and rebuilding existing buildings in Thornton Road. Mr. A. R. Hill, A.R.I.B.A., architect, 23 Piccadilly, Bradford.

Camerton.—Nov. 2.—For erection of a dwelling house at Camerton, Cumberland. Messrs. Donald & Donald, architects, 14 John Street, Workington.

Cark-in-Cartmel (Lancs).—Oct. 31.—For erection and completion of six semi-detached villas. Messrs. J. W. Grundy & Son, architects and surveyors, Central Buildings, Ulverston.

Droylsden.—Nov. 5.—For alterations required to the institute, to convert the same into public offices, &c. Mr. Charles Hall, engineer and surveyor, Council Offices, Droylsden, Lancs.

Dublin.—Nov. 1.—For the construction of an underground public convenience at James's Street, and the sanitary fittings for same. (*a*) For the building work, and (*b*) for the sanitary work. Deposit 1*l.* 1*s.* each. Mr. J. G. O'Sullivan, borough surveyor, City Hall, Dublin.

Dublin.—Nov. 3.—Tenders for the erection of a metropolitan police barrack and station at Fitzgibbon Street. Deposit 1*l.* The Office of Public Works, Dublin.

Durham.—Nov. 2.—For the construction of brick and concrete foundations, drains, sewage tank, and filter beds, and providing and fixing stoves and range, baths, lavatories, w.c.'s, sinks, and hot and cold water pipes and fittings for the proposed new smallpox hospital at Shincliffe Mill, near Durham. Mr. George Gregson, surveyor, 38 Sadler Street, Durham.

Dutton.—Nov. 9.—For the entire work of the erection of a new scarlet fever block, to hold twelve beds, at the Infectious Diseases Hospital, Dutton, Runcorn. Deposit 1*l.* Mr. Percy Silcock, architect, Egypt Street, Warrington.

Eastbourne.—Nov. 8.—For the erection of Eastbourne new post office. The Post Office, Eastbourne, or H.M. Office of Works, Storey's Gate, London, S.W.

Glasgow.—Oct. 29.—For the following works in the extension and additions to the administrative block and Avenue Home, Belvidere Hospital, and the cleaners' block, Ruchill Hospital, viz.:—(1) Digger, brick and mason works; (2) carpenter and joiner works; (3) plumber work; (4) slater work; (5) plaster work; (6) tile work; (7) heating work; (8) electric lighting and gas fitting work; and (9) painter work. The Office of Public Works, 64 Cochrane Street, Glasgow.

Gosforth.—Nov. 8.—For the construction of public conveniences in the vicinity of the Council Chambers. Mr. George Nelson, A.M.I.C.E., Council Chambers, High Street, Gosforth.

Grendon.—Oct. 31.—For the erection of an isolation hospital at Grendon, within the district of Atherstone, for the Atherstone Rural District Council. Deposit 2*l.* 2*s.* Mr. H. J. Coleby, engineer and surveyor, 102 Long Street, Atherstone.

Hales Owen.—Nov. 1.—For the extension of the Great Western Railway Co.'s goods office. The Engineer, G.W.R. Wolverhampton Station.

Henbury.—Nov. 1.—For certain alterations and extensions to the girls' and infants' schools at Henbury, Glos. Deposit 2*l.* 2*s.* Mr. Maynard Froud, architect and surveyor, 1 St. Stephen's Chambers, Baldwin Street, Bristol.

Horsforth.—Oct. 31.—For the erection and completion of caretaker's lodge at the Sewage Works, Horsforth, near Leeds. Deposit 1*l.* 1*s.* Mr. H. Raven, engineer, Council Offices, Horsforth.

Hull.—For alterations and additions to the Artillery Barracks, Park Street, for the East Riding Territorial Force Association. Send names, together with a deposit of 2*l.* to Messrs. Wellsted, Dossor & Wellsted, City Square, Hull, and A. Easton, joint architects, 7 Land-of-Green-Ginger, Hull.

Ireland.—Oct. 31.—For rebuilding the bank premises, South Mall, Cork, for the Directors of the Munster and Leinster Bank. Mr. Arthur Hill, architect, 22 George Street, Cork.

Ireland.—Nov. 3.—For the erection of a metropolitan police barrack and station at Fitzgibbon Street. Deposit 1*l.* Mr. H. Williams, secretary, Office of Public Works, Dublin.

Ireland.—Nov. 4.—For the erection of a villa, near Kiltonga, Newtownards. Messrs. Young & Mackenzie, Scottish Provident Buildings, Belfast.

Isle of Man.—Nov. 22.—For the construction of a lighthouse tower, engine room, and dwelling houses on Maughold Head, near Ramsey, Isle of Man, for the Commissioners of Northern Lighthouses. Deposit 1*l.* 1*s.* Messrs. D. & C. Stevenson, civil engineers, 84 George Street, Edinburgh.

Isleworth.—Nov. 1.—The Brentford Guardians are prepared to receive tenders for alterations and additions to the heating and hot water service, the construction of subways, and additions to existing buildings, and the sinking of a well at their institutions, comprising the workhouse, infirmary and schools, all situate in Twickenham Road, Isleworth. Mr. E. R. Dolby, M.Inst.C.E. (Dolby & Williamson), 8 Princes Street, Westminster, S.W. The work is divided into three sections, viz.:—(1) General engineering work, (2) building work, (3) well and pumping plant. Deposit 3*l.* 3*s.* each section. Mr. William Stephens, clerk to the guardians, Union Offices, Isleworth, W.

Itchen Sholing.—Nov. 10.—For erection of a Council school for 380 children at Itchen Sholing, Hants. Deposit 2*l.* 2*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Kettering.—Nov. 3.—For erection of bath rooms at the isolation hospitals, Rockingham Road. Messrs. Gotch & Saunders, Bank Chambers, Kettering.

Leeds.—Nov. 10.—For the enlargement of head post office. Mr. R. M. Gruggen, H.M. Office of Works, Infirmary Street, Leeds. Send 1*l.* deposit to H.M. Office of Works, Storey's Gate, London, S.W.

London.—Nov. 1.—For following alterations and repairs at their workhouse, Silver Street, Upper Edmonton, for the Guardians of the Strand Union:—(1) New lightning conductor to the clock tower, (2) repair of lightning conductor and brickwork to boiler chimney shaft, (3) supply and fix

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other lightning conductors to the main building. Guardians' Offices, 15 Henrietta Street, Covent Garden, W.C.

Lowestoft.—Oct. 31.—For the erection of a drill hall, with gun shed, &c., and instructor's house upon a site in the Beccles Road, for the County of Suffolk Territorial Force Association. Mr. F. W. Richards, M.S.A., architect, 14 Stanley Street, Lowestoft.

Maidenhead.—Oct. 29.—For small alterations and additions to the Church of England schools, East Street. Mr. Clifton R. Davy, architect, 86 High Street, Maidenhead.

Manchester.—Oct. 29.—For the erection of new Labour Exchange, Manchester, for the Commissioners of H.M. Office of Works, &c., Storey's Gate, S.W.

Manchester.—Nov. 10.—For the supply of red terra cotta for the new Gibbon Street Council schools, Beswick; also for the new infants' school at Clarendon-road, Crumpsall. Deposit 1*l.* 1*s.* each contract, payable to the Accountant, the Education Offices, Deansgate, Manchester.

New Cleethorpes (Lincs).—For erection of the New Cleethorpes Constitutional Club. Deposit 2*l.* 2*s.* Mr. John J. Cresswell, architect, 77 Victoria Street, Grimsby.

North Duffield.—Nov. 3.—For erection of implement shed and granary at Redmoors Farm. Mr. Andrew Moscrop, land agent, Thorganby Hall, York.

Ogden.—Nov. 5.—For the various works required in the erection of a detached villa residence and appurtenances at Jane Green, Ogden, near Halifax. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Oswestry.—Nov. 11.—For erection of a secondary school to accommodate 140 pupils at Oswestry, for the Salop education committee. Deposit 2*l.* 2*s.* Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

Purton.—Oct. 29.—For supplying and fixing an outside iron staircase, &c., at the workhouse. Mr. R. J. Beswick, M.S.A., 10 Victoria Road, Swindon.

Portsmouth.—Nov. 9.—For erection of a wall and iron fence around a portion of their land at Milton, Portsmouth, for the Guardians. Deposit 2*l.* 2*s.* Messrs. Rake & Cogswell, architects, Prudential Buildings, Commercial Road, Portsmouth.

Scarborough.—Oct. 28.—For alterations and additions to premises, No. 82 Castle Road. Mr. J. Caleb Petch, architect, Bar Chambers, Scarborough.

Scotland.—Oct. 31.—For the mason, carpenter, slater, plaster, plumber, and painter and glazier works of alterations on the Aboyne public school, for the Aboyne and Glentanar School Board, Aberdeen. Mr. H. W. Torry, clerk to the Board, or Mr. Geo. Bennett Mitchell, architect, 148 Union Street, Aberdeen.

Scotland.—Nov. 2.—For the mason, carpenter, plumber, slater, plasterer, and painter works of teacher's house to be erected at Clackmarras. Mr. John Wittet, architect, Elgin.

Stockport.—Nov. 1.—For shop fittings at new branch premises, South Reddish. Deposit 10*s.* The Stockport Industrial and Equitable Co-operative Society, Ltd. The Secretary's Office, 42 Chestergate, Stockport.

Swinton.—Nov. 2.—For erection of a fireproof staircase at their schools at Swinton, near Manchester, for the Manchester Board of Guardians. Deposit 10*s.* 6*d.* Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

Thornbury.—Nov. 1.—For the construction of a cattle market and contingent works at Streamleaze. Deposit 2*l.* 2*s.* Mr. T. B. Cooper, A.M.Inst.C.E., Sun Buildings, Clare Street, Bristol.

Thurnscoe.—Nov. 3.—For the school enlargement (builder, joiner, slater, plasterer, painter). Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield. The Education Architect, Wakefield.

Urmston.—Nov. 9.—For the erection of an elementary school at Urmston, near Manchester, to accommodate 400 children. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Wales.—Nov. 2.—For erection of a house at St. Dogmaels, Cardigan. Mr. C. Owain ap Gruffydd, architect, Abigail House, St. Dogmaels.

Wales.—Nov. 4.—For the carrying out of the following work for the Rhondda Urban District Council, viz., erection of a new school at Ynyswen, to accommodate 400 infant scholars. Mr. Jacob Rees, architect, Hillside Cottage, Pentre. Send 2*l.* 2*s.* deposit to the Accountant, Council Offices, Pentre.

Wales.—Nov. 8.—The Royal National Lifeboat Institution invite tenders for the construction of a galvanised corrugated steel and timber boat-house, timber approach, and reinforced and solid concrete lifeboat slipway at Porth 'Stinian, near St. David's, Pembrokeshire, upon or adjacent to the foreshore and sea-bed thereat. Dr. W. Wilfrid Williams, local hon. secretary, St. David's, Pembrokeshire, or at the office of Mr. W. T. Douglass, M.Inst.C.E., engineer and architect to the institution, 15 Victoria Street, Westminster, S.W.

Wales.—Dec. 5.—For erection of twenty-eight semi-detached villas at Seven Sisters, near Neath. The Dulais Collieries Company's Office, Onllwyn, near Neath.

West Stanley (Durham).—For erection of club and institute, West Stanley. Forward names to Mr. Thos. E. Taylor, architect, Lanchester, or Front Street, Annfield Plain.

Whitley.—Nov. 7.—For the construction of a concrete retaining wall and steps in connection with the improvement of the sea banks. Mr. A. J. Rousell, A.M.Inst.C.E., Council Offices, Whitley Bay.

Withington.—Oct. 31.—For the erection of baths at Burton Road, Withington, for the Manchester Corporation. Deposit 3*l.* 3*s.* City Architect, Town Hall.

TENDERS.

ENFIELD.

For erection of Oldbury Council school, for the Enfield education committee.

Tombs & Son	£25,988 0 0
Bridge, Barrett & Co.	22,665 0 0
F. & T. Johnson	22,000 0 0
Fryd	21,069 0 0
Wall	20,399 0 0
McLaughlin & Harvey	19,950 0 0
Day	19,900 0 0
Lovell & Sons	19,798 0 0
Cook & Sons	19,475 0 0
Appleby & Sons	19,100 0 0
Nightingale	18,900 0 0
Coxhead	18,825 0 0
Thomas & Edge	18,740 0 0
Lawrence & Son	18,592 0 0
Maddison	18,423 0 0
Jennings & Grenfell	18,390 0 0
Clark & Sons	18,340 0 0
Brand, Pettit & Co.	18,326 0 0
Fitch & Cox	18,290 0 0
Knight & Son	18,247 0 0
Monk	17,835 0 0
Fairhead & Son, Enfield (*accepted*)	17,674 0 0

HANLEY.

For erection of workshops and warehouses. Maddock & Sons, architects, Hanley.

	Messrs. E. L.
Wardle	£3,600 0 0
Grant & Sons	3,500 0 0
Chatfield	3,300 0 0
Colley & Lindop	3,295 0 0
Thomas	3,125 0 0
Leonard	3,100 0 0
Heath	2,879 0 0
Grant	2,855 0 0
Cornes & Son, Hanley (*accepted*)	2,840 0 0
Architects' estimate	2,875 0 0

LONDON.

For providing and fixing heating apparatus at the L.C.C. school buildings in course of erection on the Hoxton House site.

Boyd & Sons	£1,220 0 0
Burroughes & Sons	1,150 0 0
Strode & Co.	1,097 0 0
Yetton & Co.	1,089 0 0
Ashwell & Nesbit	1,042 0 0
J. & F. May	1,020 10 0
Korting Bros.	1,016 13 4
Tilley Bros.	1,012 12 0
Davis	996 0 0
Grundy	987 0 0
G. & E. Bradley	971 10 0
Comyn Ching & Co., Ltd., 54 Long Acre (*accepted*)	954 0 0

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LONDON—*continued.*

For installing electric lighting at the preceding.

Lawrance & Sons	£1,147 13 5
Central Motor Engineering Co.	1,041 4 10
Newbald & Co.	934 0 0
Weston & Sons	895 10 0
Johnson & Phillips	870 0 0
Tilley Bros.	738 7 9
Morgan	708 0 0
TROY & Co., 194 Finchley Road (*accepted*)	615 0 0

The estimates of the architect and the chief engineer respectively are 970*l.* and 813*l.*

For levelling and laying out land adjoining the County Secondary School, Bermondsey, as a recreation ground.

Lapthorne & Co.	£2,887 0 0
Maxwell Bros.	2,798 0 0
Appleby & Sons	2,772 0 0
Downs	2,346 0 0
Hollingsworth	2,268 0 0
Proctor & Sons	2,265 0 0
Garrett & Son	2,256 0 0
Groves	2,210 0 0
Leng	2,183 0 0
Holloway	1,943 0 0
Marsland & Sons, Walworth (*recommended*)	1,538 0 0
Architect's estimate	2,066 0 0

For the widening and extension of Duncane Road, Old Oak Estate, Hammersmith, for the L.C.C.

Pedrette	£6,610 6 9
Latter	6,385 18 6
Muirhead & Co.	6,271 12 1
Clift Ford	6,029 0 0
Griffiths & Co.	5,930 19 1
Anderson	5,888 4 8
Woodham & Sons	5,884 11 7
Mears	5,762 0 0
Kavanagh & Co.	5,620 12 10
Brummell	5,608 13 4
Jaggard	5,551 19 11
Wheeler & Co.	5,546 1 10
W. & C. French	5,532 8 6
Wimpey & Co.	5,332 16 9
Mowlem & Co.	5,306 0 0
Gibbon	5,178 0 0
Coxhead, Leytonstone (*recommended*)	5,055 0 0
Architect's estimate	5,530 0 0

For the erection of a police-station at Battersea. Mr. J. DIXON BUTLER, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Lathey Bros.	£12,727 0 0
Leslie & Co.	12,567 0 0
Holland & Hannen	12,275 0 0
Holloway Bros.	12,133 0 0
Grover & Son	11,894 0 0
Higgs & Hill	11,870 0 0
McCormick & Sons	11,785 0 0
Holliday & Greenwood	11,769 0 0
Ansell	11,640 0 0
Messom & Sons	11,554 0 0
Appleby & Sons	11,466 0 0
Rice & Son	11,371 0 0
Barker & Sons	11,358 0 0
Mowlem & Co.	11,333 0 0
Lorden & Son	11,285 0 0
Fryer & Co.	11,279 0 0
F. & H. F. Higgs	11,193 0 0
Sabey & Son	11,172 0 0
Adamson & Sons	11,092 0 0
Minter	10,937 0 0

For the adaptation of "Frogmore" school, Wandsworth, to accommodate sixty mentally defective and sixty physically defective children.

Holliday & Greenwood	£2,664 0 0
Akers & Co.	2,355 0 0
Bendon	2,268 0 0
Jewell	2,263 11 1
Smith & Sons	2,222 0 0
Johnson & Co.	2,179 0 0
Garrett & Son	2,147 0 0
Lole & Co.	2,143 0 0
Triggs, Clapham (*recommended*)	2,113 0 0
Architect's estimate	2,203 0 0

LONDON—*continued.*

For supply of boilers at L.C.C. schools. Group I.—Brewhouse Lane (St. George-in-the-East), Olga Street (Bethnal Green), Camden Street (St. Pancras), "Old Palace" (Bow and Bromley), Mulgrave Place (Woolwich), Ancona Road (Woolwich), Page's Walk (Bermondsey), Hackford Road (Brixton), Eltringham Street (Wandsworth), Swaffield Road (Wandsworth).

Binns & Speight	£1,203 10 0
Brightside Foundry and Engineering Co., Ltd.	1,192 15 0
Cannon & Sons, Ltd.	1,173 7 8
Cannon & Hefford	1,178 10 0
Knight & Sons	1,229 5 0
Palowkar & Sons (*recommended*)	1,110 0 0
Ritchie & Co., Ltd.	1,187 0 6
Tilley Bros.	1,172 2 6
Yetton & Co., Ltd.	1,238 5 0

For supply of boilers at L.C.C. schools. Group II.—Malmesbury Road (Bow and Bromley), St. Dunstan's Road (Fulham), Westville Road (Hammersmith), Plumstead Road (Woolwich), Gipsy Road (Norwood), Hugon Road (Fulham), County Secondary School (Bermondsey), Battersea Polytechnic Secondary (Battersea).

Yetton & Co., Ltd.	£523 15 0
Brightside Foundry and Engineering Co., Ltd.	485 9 0
Knight & Sons	484 13 6
Cannon & Sons, Ltd.	484 12 3
Ritchie & Co., Ltd.	484 12 0
Cannon & Hefford	479 10 0
Tilley Bros.	470 10 6
Beeston Foundry Co.	461 11 0
PALOWAKAR & SONS (*accepted*)	449 0 0

For erecting two iron buildings on the Magdalen Road site, Wandsworth, for the L.C.C.

General Iron Foundry Co.	£1,760 0 0
Palmer & Co.	1,598 0 0
Harbrow	1,570 0 0
Eyles	1,548 0 0
Roberts	1,254 0 0
Harris	1,250 0 0
WHATLEY, Greenwich (*accepted*)	725 0 0
Architect's estimate	1,130 0 0

For the execution of the roadwork and platelaying, exclusive of the supply of rails and special trackwork, in connection with the reconstruction, on the underground conduit system of electric traction, of the existing tramways from Kentish Town Road, *via* Highgate Road, to Swain's Lane. The tenders also contain provision for certain paving works outside the tramway tracks in Highgate Road.

Tramway works.

Stark & Sons	£23,056 11 4
Coles	21,982 3 11
Dick, Kerr & Co.	21,360 8 9
Mowlem & Co.	21,159 12 1
Kirk & Randall, Woolwich, S.E. (*recommended*)	21,033 6 1
Chief Engineer's estimate	21,440 6 6

Paving works.

Kirk & Randall, Woolwich, S.E. (*recommended*)	£1,452 13 11
Dick, Kerr & Co.	1,377 19 0
Mowlem & Co.	1,343 14 1
Coles	1,248 13 3
Stark & Sons	1,221 0 10
Chief Engineer's estimate	1,301 8 2

For the reconstruction of Roe Bridge, carrying Mitcham Lane over the river Graveney, for the L.C.C.

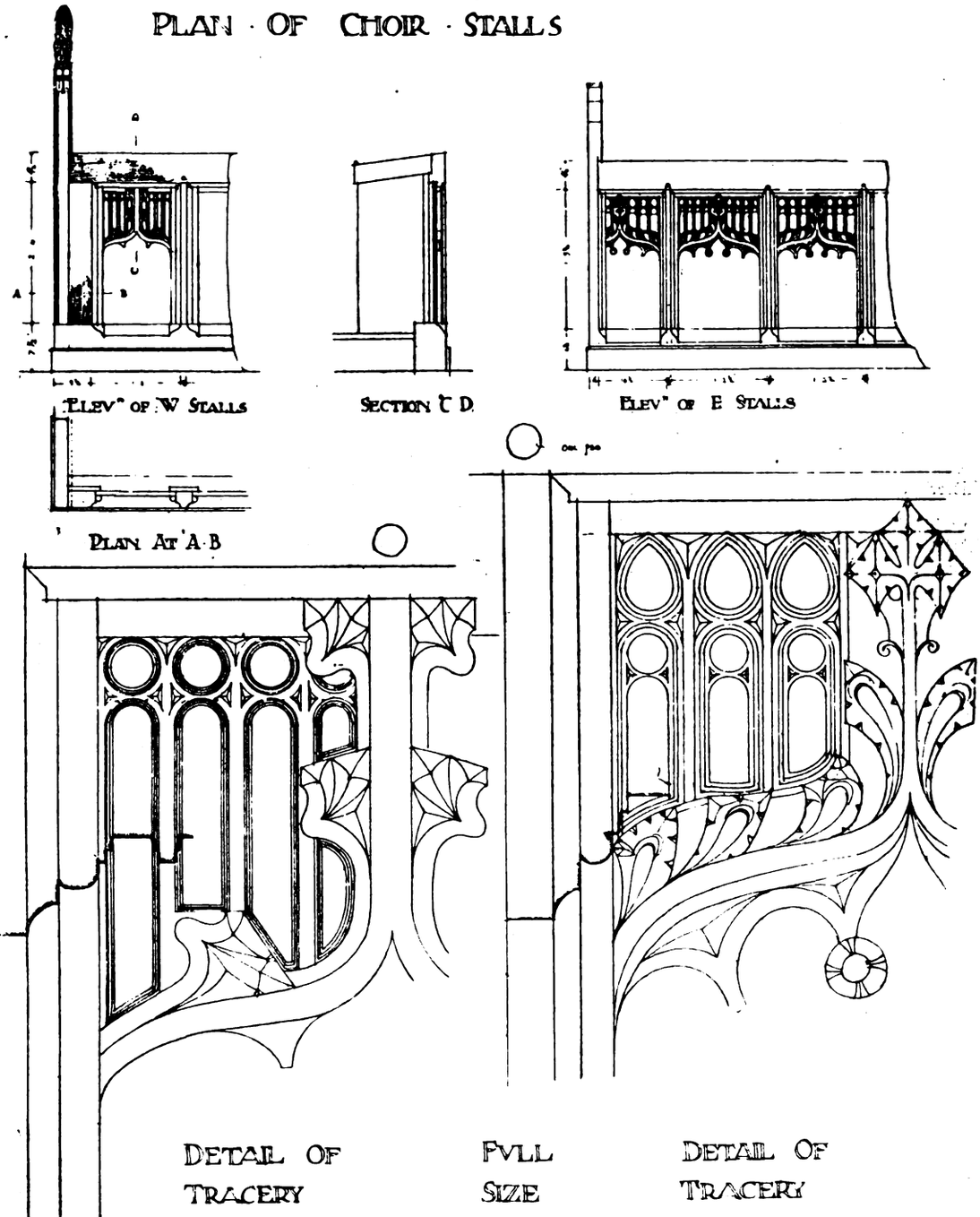
Rowlingsons & Co.	£911 7 0
Muirhead & Co.	870 12 6
Kavanagh & Co.	857 7 6
Thorne & Sons	833 6 2
Mowlem & Co.	781 0 0
E. & E. Iles	779 0 0
Pedrette, Enfield, N. (*recommended*)	759 1 0
Chief Engineer's estimate	697 6 6

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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

ST. PAUL'S CHURCH JARROW

PLAN OF CHOIR STALLS



MEASURED AND DRAWN BY "SANS PEUR."

ST. PAUL'S CHURCH, JARROW-ON-TYNE.

This church is a remarkably interesting building to all interested in Church history. The chancel forms part of the monastery church of St. Paul, founded by Benedict Biscop and dedicated in A.D. 684. Here it was that Bede spent his whole life reading, learning, teaching and writing, his constant pleasure, and around this great scholar were no less than 600 monks. The church as at present, with the exception of the tower and chancel, is quite modern, the nave, north aisle and vestry being added by Sir Gilbert Scott in 1866.

The church had previously been rebuilt in a very unintelligent and unsatisfactory manner in 1783. The nave, previous to this, was one of great interest, and unfortunately no accurate description of it exists. An eminent authority, Dean Savage, is of the opinion that after the eastern church was built (i.e., the present chancel), the western one was added as the monastery increased, and that the latter may have been used as a parochial church with the altar beneath the tower, while the former would be used as the monastic church. Other authorities, however, differ from this. The tower is later than the chancel, and dates from pre-Conquest times. It is oblong on plan, pierced with openings (round-headed) supported by baluster-shafts. The roof to the church is formed by a quadripartite vault with chamfered ribs.

The building stood originally quite independent of the tower, which is proved by the fact that the west ends of both north and south walls are not bonded into it, and have similar angle quoins to those at the eastern corners. In the south wall of chancel are "three little Romanesque windows," mentioned by Scott in his report. They are splayed on the inside only. Two of the windows have slabs inserted, and through these smaller lights are cut, while in the third the slab is missing. These windows are probably the very first in Britain that were ever glazed. The other windows are of later date, inserted at

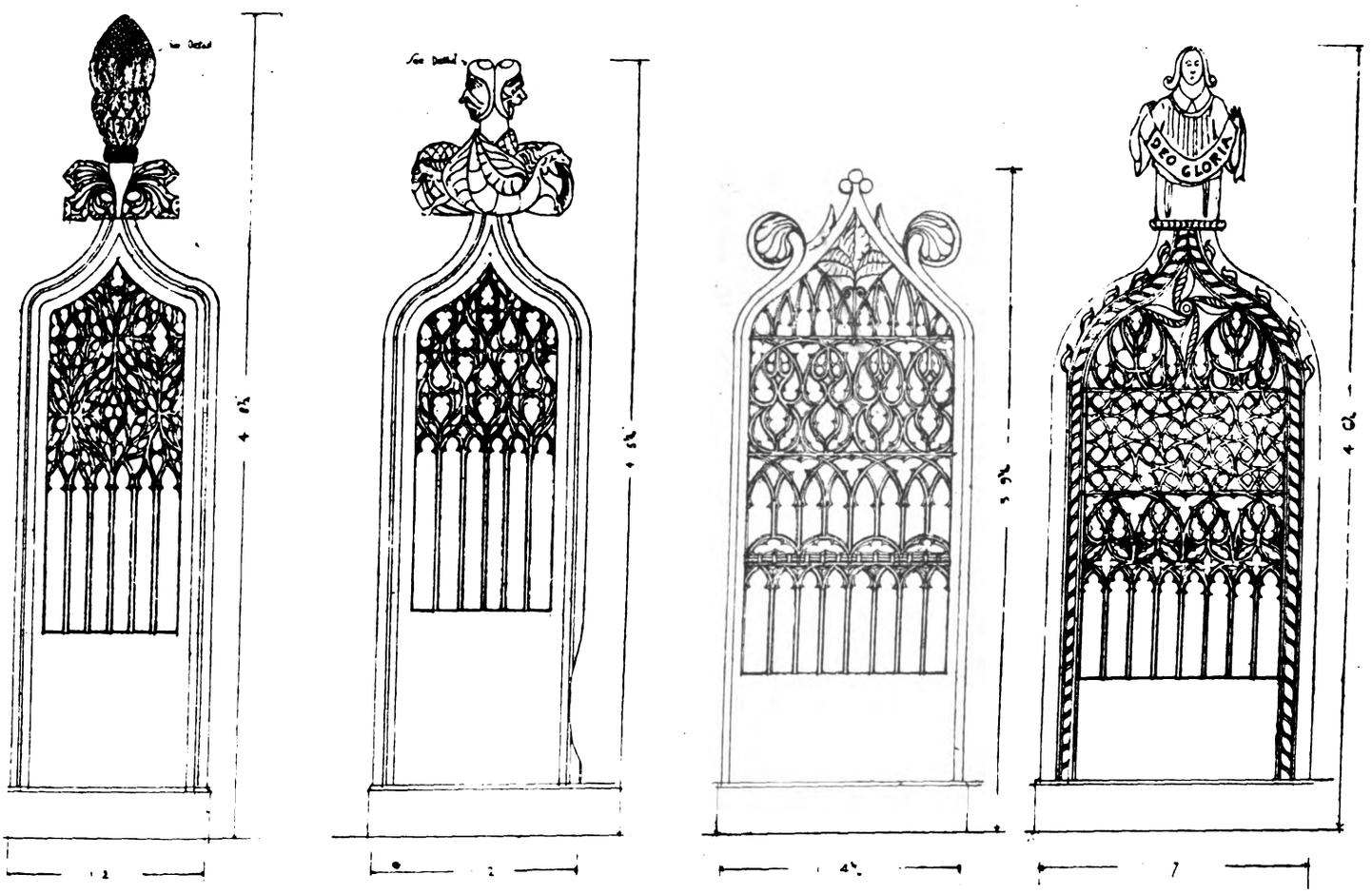
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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

ST PAULS · CHURCH · JARROW
DETAIL · OF · BENCH · ENDS

E PORTION

W PORTION



MEASURED AND DRAWN BY "SANS PEUR."

various times, and in the north wall is a low-side window. The bench ends (which form the subject of these drawings, together with the choir stalls) should be noticed. They are the work of Prior Thomas Castell (1494-1519), and are exceedingly fine.

Within the sanctuary stands the traditional Bede chair, a tall straight backed, axe hewn, rude oak seat. High up in the west wall of the tower is now fixed the original dedication stone, a plaster cast of which can be seen in the vestry. It bears a Latin inscription, which translated, reads:—"The Dedication of the Church of St. Paul, on the 9th of the Kalends of May, in the 15th year of King Egfrid, and the 4th year of Ceolfrid, Abbot, and under God the founder of the said church."

In the north porch are some interesting relics of Early Saxon work, lathe-turned shafts, fragments of Saxon crosses covered with interlaced work and excellently carved. Outside the church stand the few remains of the old monastery, a Norman doorway, and a Saxon doorway with triangular stone head being the principal remaining features. In the churchyard are still preserved the old stocks.

ARTIFICIAL STONE OF GLASS.

H.M. Consul-General at Havre (Mr. H. L. Churchill) has forwarded to the Board of Trade certain particulars relative to the manufacture of glass paving and building bricks in France, which have been furnished to him through the courtesy of the Acting United States Consul at Havre.

The stone is made in a variety of forms for paving streets, footpaths, and gutters, and for the uses to which porcelain and other tiles are put, and it is also moulded in ornamental forms and can be used for decorative purposes. The cost of production is stated by the manufacturers to vary from about 4*d*. to 5*d*. per square foot; but it is claimed that by a recent invention the cost will now be materially reduced.

Further particulars of the stone and its uses may be seen by British firms interested at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

COMPETITIONS.

The plans submitted in the recent competition for the proposed Central Library, Stockport, will be on view at the Town Hall to the public on the 29th inst. from 10 A.M. to 8.30 P.M., and on Tuesday, November 1, from 10 A.M. to 5 P.M., and to competing architects on Monday the 31st inst. from 10 A.M. to 5 P.M.

The Kingstown Urban Council, Ireland, have approved the award of Mr. G. C. Ashlin, the assessor in the competition for plans for a Carnegie Library to be erected in Lower George's Street. The first premium of 50*l*. has been awarded to Messrs. O'Callaghan & Webb, of Dublin (No. 6); and the second premium of 20*l*. to Mr. George Walker, of Liverpool (No. 33).

The Streets and Buildings Committee of Edinburgh Town Council recommend the Council to make application to the Development Commissioners for a grant of 7,000*l*. for the widening and improvement of Milton Road, in order to provide an adequate main thoroughfare from the centre of Edinburgh eastwards, so as to relieve the present thoroughfare, which passes through the narrow Portobello High Street. The Corporation have already expended over 2,000*l*. on the widening of Willowbrae Road, and the completion of the improvement at this part would more than absorb the 7,000*l*.

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SCOTLAND.

For deepening the west shore of the south bay of Cullaloe Reservoir, for the Burntisland Corporation. Mr. J. A. Waddell, burgh surveyor, Burntisland.

A. Wilson, jun.	£1,089 0 1
Ritchie	1,071 16 8
Blair	944 12 6
Adamson	930 6 1
Martin	873 15 8
Robertson, Inverkeithing (*accepted*)	869 0 1

For alterations and additions to the Duns High School. Messrs. R. A. Bryden & Robertson, architects, Glasgow.

Accepted tenders.

Meiklejohn & Son, joiner	£1,832 16 5
Brown, Fraser & Co., mason	1,497 0 0
McFeat, plumber and gas-fitter	527 0 0
Turner, plaster and cement	307 17 6
Brown & Son, tile work	247 2 8
Boyd & Sons, heating	216 0 0
Bennett, class room fittings	153 5 4
Jardine & Sons, painter	149 5 9
Turner, slater	144 11 9

SLOUGH.

For erection of a secondary school (to accommodate about 120 children) at Slough, Bucks.

Buildings, &c.

Burfoot & Sons	£6.569 0 0
Green	6.384 0 0
Tombs & Sons	5.925 3 10
Harris	5.859 0 0
Cox & Sons	5.760 0 0
Lovell & Son	5.722 0 0
Gibson & Son	5.644 0 0
Hacksley Bros.	5.628 0 0
Mead	5.595 0 0
Bowyer	5.543 0 0
Biggs & Sons, Great Kingshill (*accepted*)	5,410 0 0

Laboratory fittings.

Biggs & Sons (*accepted*)	256 0 0

STUBSHAW CROSS.

For concreting the interior of the service reservoir, and other works, for Abram Urban District Council. Mr. W. H. Roby, surveyor.

Cowburn & Son	£1,510 4 2
Asheroft	1,032 0 0
Darbyshire & Collett	995 0 0
Johnson & Son	800 0 0
Webster & Winstanley	800 0 0
H. & F. Lomax	750 0 0

WALES.

For erection of premises in Commercial Street, Mountain Ash, for the Constitutional Working Men's Club, Ltd. Messrs. Morgan & Elford, architects, Mountain Ash.

Phillips & Davies	£8.576 0 0
Evans & Bros.	7,387 18 0
John	7,370 0 0
Webb & Son	7,294 7 10
Spencer, Santo & Co.	7,283 0 0
Davies & Sons	7,000 0 0
Jenkins & Son	6,990 0 0
Jones Bros.	6,980 0 0
Davies, Cardiff (*accepted*)	6,750 0 0

For the erection of a police station at Ynysddu (Mon.). Mr. William Tanner, F.S.I., county surveyor, Newport.

Richards	£3.050 0 0
Spencer, Santo & Co.	2.997 0 0
James	2.989 0 0
Blackburn & Knowler	2.739 0 0
Davies & Sons	2,700 0 0
Jenkins	2.575 0 0
Leadbeter	2,537 0 0
Foster & Hill	2,496 0 0
Colborne	2,464 0 0
King & Co.	2,448 0 0
Kirby & Westacott	2,440 0 0
Reed	2,400 0 0
Moon	2,400 0 0
Phillips	2,354 2 6
Williams, Newport (*accepted*)	2,347 0 0

WALES—*continued.*

For alterations and additions to the boys' and girls' departments of the Hopkinstown Council school, Pontypridd. Mr. W. E. Lowe, surveyor.

Jones Bros.	£3,439 0 0
Evans & Bros.	2,960 15 5
E. Jones	2,734 0 0
R. Jones	2,700 0 0
Davies & Sons	2,596 0 0
Williams & James	2,574 12 0
Howells	2,456 0 0
Shail, Llandaff (*accepted*)	2,400 0 0

WILLINGTON.

For levelling, paving, &c., for Urban District Council. Mr. J. H. Gardner, surveyor.

Reevel	£351 9 8
Pickering	272 15 0
Henderson	268 8 0
Robinson	249 7 0
Harmory, Willington (*accepted*)	237 0 0

PORT RATES ON GOODS.

We are officially informed by the Port of London Authority that on and after November 1 next port rates will be payable in respect of all goods imported or exported into or from the Port of London from or to parts beyond the seas or coastwise.

The rates will be payable at the office of the Collector, 13 and 14 George Street, Tower Hill, E.C., between the hours of 8 A.M. and 4 P.M., Sundays and public holidays excepted.

Each payment must be accompanied by a bill giving particulars of the goods in respect of which it is made.

Copies of the list of port rates, containing also information relative thereto, and forms of bills can be obtained at 109 Leadenhall Street on and after Monday, October 24.

Deposit accounts, which must be entirely independent of any other deposit accounts for rates or charges, may be opened for the payment of port rates, and this may be done at the Collector's office on and after Wednesday, October 26.

The West Riding Education Committee propose to build schools at Adwick-le-Street, South Elmsall, and South Kirkby, each for 1,000 children, and to cost 10,000*l.* each.

The export of Caen stone rose from 5 tons in 1908 to 990 tons in 1909, in consequence of the starting of a new company and the reopening of the quarries.

At a Dean of Guild Court at Helensburgh, N.B., on Monday lining was granted for new coal store and gas retorts to be erected at the Burgh Gasworks at a cost of 11,000*l.* The West Gas Improvements Company, Ltd., hold the contract.

A faculty is to be obtained for enlarging the Priory Church, Worksop. It is proposed to rebuild the choir of the church, thus affording much-needed additional accommodation. The Lady chapel (now in ruins) is to be incorporated. There will be a total increased accommodation for 661 persons. The estimated cost of the scheme is 12,200*l.*

The foundation-stone of the new engineering laboratories at Liverpool University was laid on the 22nd inst. The cost, inclusive of equipment, is estimated at 35,000*l.* Messrs. Briggs, Wolstenholme & Thornely are the architects, and the general contractors are Messrs. Joshua Henshaw & Sons.

It was arranged to keep the Town-planning Exhibition at the Royal Academy open a week longer, so the closing day will now be October 29. On the suggestion of Mr. John Burns, the committee have decided to admit visitors without payment on the last day. Tickets may be had by personal application at Burlington House.

Mr. Henry Price, city architect, Manchester, has prepared a plan for the enlargement and better ventilation of the Council Chamber of the Town Hall. The estimates are as follows:—Cost of structural alteration of Council Chamber, 2,100*l.*; removing present gallery and providing new one, 750*l.*; new lavatory, with necessary structural alterations, 350*l.*; reseating, 1,000*l.*; decorating (new work only), 500*l.*; contingencies, 300*l.*; total, 5,000*l.*

The London County Council in May last sanctioned expenditure of 215*l.* and 459*l.* for the supply of equipment and materials respectively to the L.C.C. School of Building (Brixton) during the session 1910-11. These amounts included a sum of 90*l.* in respect of the new classes in reinforced concrete. It was not anticipated at the time that more than 20 students would attend these classes. In view, however, of the fact that 74 students have been enrolled it is necessary to supply additional equipment at an estimated cost of 150*l.*

Mr. A. H. Campbell, A.M.I.C.E., borough surveyor, East Ham, was on Tuesday appointed burgh surveyor by the Edinburgh Town Council. The salary is 800*l.* a year.

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TRADE MARKS OF CONSTRUCTIVE MANUFACTURERS.

We have received from Jacques Gevers & Co., L'Agence de Brevets et Marques de Fabrique, 70 Rue Saint-Jean, Antwerp, the following list of trade-marks published in May and June 1910.

ENGLAND.

Cement.

"Keebo"	Henry George Atkinson, 28 The Calls, Leeds, Yorkshire.
"Queen of Diamonds"	Kittel & Co., Ltd., 5 Fenchurch Street, London.
"Anglian"	East Anglian Cement Co., Ltd., 4 Tenison Avenue, Cambridge.

Constructive Materials.

"Park"	Devereux Hall, trading as John Hall & Son, The Midland Railway Goods Buildings, Rowsley, Derbyshire.
"Emerite"	Alfred James Hobman & Co., Cliftonville, Stockholm Road, South Bermondsey, London, S.E.
"M.S.L.A."	The Seyssel & Metallic Lava Co., 42 Poultry, London, E.C.
"Klinxcrete", "Durocrete"	Arthur Oct. Edwards & Co., Granville House, Arundel Street, Strand, London, W.C.
"Carbolith"	Henr. Percy Gormanston Steedman, 25 Victoria Street, London, S.W.
"Medusa"	Reginald W. Barker, Vulcan House, 56 Ludgate Hill, London.
"Dolorite"	Daniel Cunningham & Son, 1 Newark Place, Kilmalcolm, Scotland.
"Almeta-Gypso"	George Merrow & Son, Ltd., 40 Clifton Street, Belfast, Ireland.

Paints, Varnishes and Various Preservative Compositions.

"Ganda"	Francis Cook and Frank Andrew, 46 Lincoln Street, Kingston-upon Hull.
"Niklon"	C. A. Birch & Co., Trundle Street Paint Works, Trundle Street, Hull.
"Ermine"	Ripolin, Ltd., 35 Minories, London, E.C.
"Bitromarc"	S. T. Taylor & Sons, Tynos Works, Scotswood, Northumberland.
"Ferroradium"	Jenson & Nicholson, Goswell Works, Warton Road, Stratford, E.
"Lynopan"	James Morris, jun., 40 Ashburton Road, Birkenhead, Cheshire.
"Silox"	The Lugsdale Chemical Co., Ltd., Widnes, Lancashire.
"Saphirol"	The Bayer Co., Ltd., 20 Booth Street, Manchester.
"Lucosine"	Rolls & Co., Ltd., 1 College Gardens, Upper Edmonton, Middlesex.
"Comet Brand"	Suter, Hartmann & Rahtjens's Composition Co., Ltd., 18 Billiter Street, London, E.C.
"Veritone"	Pinchin, Johnson & Co., Ltd., Minerva House, 26 & 27 Bevis Marks, London, E.C.
"A.I."	The Anglo-Indian Manufacturing Co., Ltd., Sun Buildings, Bridge Street, Manchester.
"Bitumex"	A. H. Davis, Ltd., 29 Maguire Street, Liverpool.
"Tregona"	Tabor, Trego & Co., Ltd., 41 Bishopsgate Street Within, London.
"H.T.B."	Henry Therald Brookes, 4 Claremont Street, Shrewsbury.
"Solactic"	James Addie & Co., Priory Works, Gladstone Street, Cardiff.

FRANCE.

Cement.

"Chaun Forte du Champa", "Uriol", "Ciment Prompt", "Centaure", "Portland Naturel", "Portland Artificiel"	Société anonyme de Ciments Prompts et Portland artificiels à Grenoble, 34 Avenue de la Gare, Grenoble.
"La Fama"	MM. P. Virabian et Co., 16 Rue du Pavillon, Marseilles.

Constructive Materials.

"Kremelins"	Marchand et Co., Chauvigny.
"Prevost"	Joseph Prévost, Avallon.
"Em"	M. Bourgeois aîné, 18 Rue Croix-des-Petits Champs, Paris.
"Storer & Sons"	Wilkinson, Heywood & Clark, Ltd., 7 Caledonian Road, London, N.
"Toufik A. Bedaoui, Damas"	L. E. H. Rouband de Masin, 21-25 Rue Saint-Bruno, Marseilles.
"Wolfite"	Société Lefranc et Co., 18 Rue de Valois, Paris.
"Torfit"	Louis Schwarz & Co., Actiengesellschaft, Hamelingen, Germany.
"Vitrum"	J. Pareyn, 95 Rue Royale, Ste-Mane, Brussels.

Paints, Varnishes and Various Preservative Compositions.

"Soehnee Freres"	Bolloré-Soehnée, Paris.
"W.L.R."	Société Lambert Rivière et Co., 82 Rue St. Lazare, Paris.

GERMANY.

Cement.

"Alcantarilla"	Wunstorfer Portland-Cementwerke, Act.-Ges., Wunstorf.
"Bavaria-Mast"	Rud. Wolle, Leipzig.
"B.C."	Société anonyme Le Boro-Carbone, Paris.
"Biebricher's Portland Zement"	Wil. Biebricher, Barmen.
"The Falcon"	Martin Falk, Hamburg.
"Griffon"	Rammelberg & Heicke, Altdamm 1. Pom.

Constructive Materials.

"Owl-Brand"	Fr. Ales. & Co., Schmirgel-Industrie, Cologne.
"Linoleumstjaere"	Ronning & Gjerloff, Copenhagen.
"Komerofing"	Ernst Herre, Berlin.
"Pyrikmet"	Walther Volkenrath, Cologne.
"Rhenania"	Jean Engelsmann, Ludwigshafen a.Rh.
"Sungama"	Levi & Wagnus, Sungama Marmorfabrik, Cassel.
"Stabilit"	Heinrich Lönholdt & Co., Frankfurt a.M.
"Mairich"	Windschild à Langelott, Dresden.
"Paltack"	C. F. Beer Söhne, Cologne.
"Günthers-Granit-Putz"	Amalie Lina Günther geb., Auerbach i. Bogtl.
"Wallinit"	Edouard Wallin, Hamburg.
"Spukburg"	Wilhelm Feindt, Berlin.
"Asphaltwerk Emil Köllner"	Asphaltwerk Emil Köllner, Leipzig.
"Cementol"	Ludwig Kerkow, Gross-Buchholz, Hanover.
"Ereuterol"	Emil Reuter, Oberschöneweide, Berlin.
"Etoile"	Kapferer & Co., Terranova-Industrie, Freihung.
"L'Allur"	Gluère & Co., Nantes.
"Reiss'scher Lüfter"	Ernst Reiss, Düsseldorf.
"Fervidaer"	Dr. Alfred Fessnitser & Co., Ltd., Rixdorf.
"Bühoff"	Büsscher & Hoffmann, Ltd., Eberswalde.
"Barusin"	Büsscher & Hoffmann, Ltd., Eberswalde.
"Alsatia"	B. Pfister, Strasbourg, Kuprechtsau i.Els.
"Helmstedter Thonwerke Rühne & Co."	Rühne & Co., Helmstedter Thonwerke, Helmstedt.
"Herkules"	Gesellschaft für Otto Schmidt's Patent, Herkulessteine, Ltd., Dresden.
"Bonit"	Johann Bonner, Daxlanden.
"Rostolit"	Wilhelm Eckardt & Ernst Hotop, Ltd., Berlin.
"Lapillit"	Emil Birkner, 65 Glauchauer Chaussée, Erimmitschau.
"Verafix"	Rindsfüsser und Reichert, Frankfurt a.M.
"Christolit"	Christolitwerke, Ltd., Hof. Bavaria.
"Boro-Carbone"	Société anonyme Le Boro Carbone Paris.
"Euboeolapis", "Eub osol", "Euboeaton"	Euboolithwerke Act.-Ges., Olten, Switzerland.
"Monalit"	Idawerk, Ltd., Crefeld-Linn a. Rh.

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"Diabasit"	Harzer Pflastersteinbrüche Langelsheim, Ltd., Langelsheim a. H.
"Planolin"	Ch. H. Pfister & Co., Basel.
"Teufelsmuhle"	Jgnaz Lambertz, 174 Hohetorchaussee, Bremen.
"Syenitoid"	Ludwig Göderitz, 2 Mosczinskystrasse, Dresden.
"Starrkopf"	Hermann Neumann, 13 Kronenstrasse, Königsberg i. Pr.

Paints, Varnishes and Various Preservative Compositions.

"Telacin"	Hamburger Farben-Industrie, Ltd., Eidelstedt, Hamburg.

SWITZERLAND.

Cement.

"Euböith" "Pilokollan" "Euborit" "Euperlit" "Pilokollan"	Euböolithwerke Act.-Ges., Olten, Switzerland.

Constructive Materials.

"Satinas" "Hygela"	W. Wirz-Wirz, Basel, Switzerland.
"Liegite" "Mosique"	Soc. Suisse des Liéges agglomérés, Carouge, Switzerland.

Paints, Varnishes and Various Preservative Compositions.

"Vitofarbe"	H. R. Koller, Winterthur, Switzerland.

TRADE NOTES.

The "Berkefeld" filter has been awarded three Grand Prix and one Diploma of Honour at the "Brussels Exhibition," 1910.

A large clock has just been erected in the Bradshaw Street Council Schools, Nelson, Lancs. The clock has a large illuminated dial and strikes the hours. Messrs. John Smith & Sons, Midland Clock Works, Derby, have carried out the work. A few years ago the same firm made the large chiming clock at Nelson Market Hall.

The National Schools, Bridport, and the new Recreation Hall, Lower Sydenham, are being ventilated by means of Shorland's patent exhaust roof and special inlet ventilators supplied by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester. The new isolation hospital, West Molesey, is being supplied with Shorland's warm-air ventilating patent Manchester grates and ventilators; and the new Board Schools at Torthorwald, N.B., are also being supplied with Manchester grates by Messrs. Shorland & Brother, Ltd.

The London and Lancashire Fire Insurance Company have issued the eighteenth edition of their Cotton Crop Book. The brochure, which is increasing in popularity year after year, presents in a handy form very useful information regarding the movements of the cotton crop. The book has been enlarged by the introduction of some new tables regarding the Indian and Egyptian crops. To those of our readers interested in the cotton trade the issue should form a useful book of reference.

Messrs. George Mills & Co., Ltd., Radcliffe, have received the following letter from the manager of the Crawshawbooth Mill, Ltd., spinners, Rawtenstall:—"A fire occurred here on the 20th inst., near a pair of bevel wheels in the card-room. In an instant a great blaze shot up and followed the flywheel of the engine. As there is considerable wheel-grease and fluff about it was very fierce, and I consider it would have been disastrous for us only a sprinkler immediately over the wheels went off and beat the flame downward, and so gave it no chance of catching the mule-room floor, which is very oily. Our only damage was two carding engines drenched with water. I may say we have nearly 500 'Titan' Sprinkler Heads, which were put in nearly five years ago, and this is the only water damage we have had, and we have a running pressure of 80 lbs. constantly. I am sure nothing could have acted quicker on Thursday."

Messrs. John Gibbs & Son, warming and ventilating engineers, Liverpool, have equipped the s.s. *Leicestershire* recently completed by Messrs. Harland & Wolff for Messrs. Bibby, of Liverpool, with their patent weatherproof extractors and downcast ventilators. This system was subjected to a severe test as to its positive weatherproof qualities and gave most reassuring results. Those parts intended for positions in the more exposed portions of the vessel have been made of special strength in accordance with the new system of construction designed by John Gibbs & Son. The firm have, of course, a reputation for ventilating and other engineering work on land as well as on vessels. Their air-propelling and ventilating fans are, for example, favourably n to architects and engineers.

VARIETIES.

The Pontefract Corporation have decided to purchase five acres of land for the erection of working-men's houses.

A village institute is to be erected at Moreton Say, Salop, as a memorial to Lord Clive, who was born at Styche Hall, and whose grave is in the parish churchyard.

The Manchester City Council have given notice of their intention to provide a public elementary school for about 1,000 children at Chorlton-cum-Hardy.

A company with a capital of about 61,000*l.* is being formed to carry on electric iron and steel smelting at Ullensvang, Hardanger, Norway. It is stated that this company, which will have over 4,000 h.p. of electrical energy at its disposal, will begin work next spring.

The Marylebone Borough Council have agreed to acquire from Viscount Portman a freehold site in Marylebone Road, at a cost of 44,500*l.*, which it was stated worked out at 1*s.* a foot, for the purpose of erecting a town hall. The building will, it is estimated, cost 60,000*l.*

The Yorkshire Federation of Building Trade Employers held their monthly meeting on the 21st inst. at Sheffield. Mr. W. G. England, of Barnsley, presided over an attendance of about seventy members.

A new infirmary is to be built by the municipal authorities of Szeged (Hungary) on the plans of Herr Floris Korb, architect, of Budapest. The building works are to cost 2,257,000 kronen (94,000*l.*), the heating installation 12,500*l.*, lighting 6,250*l.*, and internal equipment 10,500*l.*

The provisional acceptance is recommended of estimates for the heating and ventilation of the Usher Hall, Edinburgh, and for the reinforced concrete in connection with the buildings. The estimate for heating and ventilation amounted to 2,498*l.*, the other to 4,830*l.*

The Engineering Standards Committee have issued a revised specification for steel conduits for electrical wiring. Owing to the obliteration of the inspector's stamp by the galvanising process difficulties had arisen in the practical carrying out of the first specification. The committee have therefore revised the clauses dealing with the gauging of the tubes, so that they may be gauged after instead of before galvanising.

Messrs. T. C. & E. C. Jack announce that they are issuing early in November Vol. I. of the important work by Mr. Edwin Foley, entitled "Decorative Furniture." The work is to be completed in two volumes, and will contain 100 plates in colour, in addition to over 1,000 engravings in the text. It will be the most comprehensive work on old furniture hitherto attempted.

The Hull city engineer (Mr. A. E. White) has prepared the plans for a landing stage on the Humber, which have been practically approved by the Great Central Railway Company (who would use it for their ferry steamers) and the Humber Conservancy Board. The landing stage shown is about 380 feet in length and 60 feet in width, and the space between the inner face of the landing stage and the outer face of the Victoria Pier is 70 feet.

The Birmingham Elementary Education sub-committee recommend the acceptance of an approximate estimate of 4,500*l.*, for the erection of the infants' block of the new Council school in Sladefield Road, which estimate represents the present schedule of prices, plus 5 per cent., which the contractor claims for increased cost of materials, and that the Finance Committee borrow the amount necessary for the work.

The burgh surveyor of Ayr has prepared statistics of plans passed during the year ended October 7. The estimated cost of buildings for which warrants were granted was 52,585*l.*, as against 33,465*l.* in the previous year. The details were:—Dwelling-houses, 6,200*l.*; business premises, 36,385*l.*; alterations and minor warrants, 10,000*l.* The public buildings included 7,943*l.* spent by the Corporation on the pavilion at the Low Green, the Cattle Market restaurant, &c., 10,000*l.* by the School Board on a school, 4,000*l.* by the Liberal Club on club premises, and 5,100*l.* in the erection of halls and alterations on churches.

The Carlisle Rural District Council have passed plans from Mr. Edward J. Hill, builder, for a garden suburb at St. Ann's Hill. The site is of 10 acres, and there are 88 sites of artisans' dwellings. The houses will be semi-detached, and comprise 44 pairs. The larger type of houses will include two sitting-rooms, kitchen, four bedrooms, and bath; and the smaller type one sitting-room, a large living-room, three bedrooms, and bath. A new road will be made through the estate, which will be planted with trees. In the centre is an open space which is intended to be formed into a recreation ground, planted with trees and shrubs, and having a grass open space.

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AGENTS FOR AMERICA:

The International News Co., 5 *Bream's Buildings, Chancery Lane, London, England, and New York.*

AGENTS FOR CANADA:

Messrs. WM. DAWSON & SONS, Ltd., 91 *Church Street, Toronto, to whom all correspondence for Subscription and Advertising Rates should be made.*
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AGENTS FOR AUSTRALIA, NEW ZEALAND AND TASMANIA:

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

Special Position Spaces.—Unless ordered for weekly insertions the Proprietors cannot guarantee particular dates.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

COMPETITIONS OPEN.

BOURNEMOUTH.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

IRELAND.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

IRELAND.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

IRELAND.—The Committee having charge of the building of the proposed Church House and Synod Hall at Armagh, to be erected adjoining the Cathedral, invite correspondence from competent architects with a view to the preparation of plans. Rev. C. K. Irwin, B.D., Hon. Sec., Brantry Glebe, Dungannon, Co. Tyrone.



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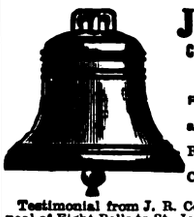
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ISLE OF MAN.—Dec. 14.—The owners of the Villa Marina, Douglas, invite designs for pavilion and laying out pleasure gardens, &c., at a cost of 16,000*l.* One award of 200*l.* and two of 100*l.* will be made, the design becoming the absolute property of the landowners. Send 1*l.* 1*s.* deposit to Mr. Alexander Robertson, Town Clerk, Town Hall, Douglas.

MANCHESTER.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Assessors: Mr. E. Guy Dawber, V.P.R.I.B.A.; Mr. H. V. Lanchester, F.R.I.B.A.; and Mr. Mervyn E. Macartney, F.R.I.B.A. Class I.—Detached house, to cost 500*l.*—first prize, gold medal and 250*l.*; second prize, 100*l.* Class II.—Detached cottage, to cost 375*l.*—first prize, gold medal and 200*l.*; second prize, 100*l.* Class III.—For the best internally fitted cottage in above classes—prize, 50*l.* Class IV.—Town plan of Gidea Park—prizes, 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes I. or II., October 31; Classes V. or VI., November 30; Class IV., March 31, 1911. Early application is requested. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, Town Planning and Modern House and Cottage Exhibition, 33 Henrietta Street, Strand, W.C.

RUISLIP.—Nov. 30.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

CONTRACTS OPEN.

ASHFORD.—Nov. 11.—For the construction of a public convenience in Beaver Road. Mr. Wm. Terrill, surveyor, Ashford, Kent.

BISHOP AUCKLAND.—Nov. 17.—For erection of new post office, for the Commissioners of H.M. Works and Public Buildings. The Postmaster, Bishop Auckland. Send 1*l.* 1*s.* deposit to H.M. Office of Works, Storey's Gate, London, S.W.

BOURNEMOUTH.—Nov. 11.—For erection of public convenience at Shelbourne Road. Deposit 1*l.* 1*s.* Mr. F. W. Lacey, M.I.C.E., borough engineer and surveyor, Municipal Offices, Bournemouth.

BOURNEMOUTH.—Nov. 14.—For new stabling and loft at the East Yard, and other works in connection therewith. Deposit 1*l.* 1*s.* Mr. F. W. Lacey, borough engineer, Municipal Offices, Bournemouth.

BRADFORD.—Nov. 9.—For alterations to shops Nos. 1 to 11 St. James's Market. The City Architect, Town Hall, Bradford.

CASTLEFORD.—Nov. 18.—The West Riding Education Committee invite whole or separate tenders for the following works:—Castleford Wesley Street Council school alterations (builder, joiner, plumber). The Education Architect, County Hall, Wakefield. Send 1*l.* deposit in each case to the West Riding Treasurer, County Hall, Wakefield.

CHOPWELL.—Nov. 10.—For erection and completion of picture hall, &c. Mr. D. M. Spence, architect and surveyor, Shotley Bridge.

DONCASTER.—Nov. 21.—For erection of a sorting office. Deposit 1*l.* 1*s.* The Head Post Office, Doncaster, or H.M. Office of Works, Storey's Gate, London, S.W.

DURHAM.—Nov. 15.—The Durham County Council invite sole tenders for (1) Wheatley Hill (for about 442 infants), Mr. W. Rushworth, Shire Hall, Durham; (2) alterations and improvements at Thornley, Kibblesworth, and removal of iron school to Seaton Snook, Mr. N. Richley, Shire Hall, Durham.

DUTTON.—Nov. 9.—For the entire work of the erection of a new scarlet fever block, to hold twelve beds, at the Infectious Diseases Hospital, Dutton, Runcorn. Deposit 1*l.* Mr. Percy Silcock, architect, Egypt Street, Warrington.

EASTBOURNE.—Nov. 8.—For the erection of Eastbourne new post office. The Post Office, Eastbourne, or H.M. Office of Works, Storey's Gate, London, S.W.

FROME.—Nov. 14.—For erection of manual instruction rooms at Frome, Somerset. The Frome Milk Street Council School, or Mr. A. J. Picton, Bruton.

GOSFORTH.—Nov. 8.—For the construction of public conveniences in the vicinity of the Council Chambers. Mr. George Nelson, A.M.I.C.E., Council Chambers, High Street, Gosforth.

IRELAND.—Nov. 8.—For building thirty-one single labourers' cottages and for fencing thirty-one plots to same, for the Irvinestown Rural District Council. Payment 5*s.* The Clerk of the Rural District Council, Board Room, Irvinestown.

IRELAND.—Nov. 17.—For the repairs of the existing labourers' cottages in the several electoral divisions for the Ballymahon Rural District Council. Mr. P. MacGreevy, clerk.

ISLE OF MAN.—Nov. 22.—For the construction of a lighthouse tower, engine room, and dwelling houses on Maughold Head, near Ramsey, Isle of Man, for the Commissioners of Northern Lighthouses. Deposit 1*l.* 1*s.* Messrs. D. & C. Stevenson, civil engineers, 84 George Street, Edinburgh.

ITCHEN SHOLING.—Nov. 10.—For erection of a Council school for 380 children at Itchen Sholing, Hants. Deposit 2*l.* 2*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

LEEDS.—Nov. 10.—For the enlargement of head post office. Mr. R. M. Gruggen, H.M. Office of Works, Infirmary Street, Leeds. Send 1*l.* deposit to H.M. Office of Works, Storey's Gate, London, S.W.

LIVERPOOL.—Nov. 12.—For alterations and additions to the Brownlow Hill Workhouse. Send names by Nov. 12 to Mr. H. J. Hagger, vestry clerk, Parish Offices, Liverpool. Messrs. Haigh & Thompson, architects, 2 Exchange Street, East, Liverpool.

LONDON.—Nov. 10.—For alterations to Avenue Telephone Exchange, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London.

LOUGHBOROUGH.—Nov. 15.—For erection of St. Peter's Church. Deposit 2*l.* 2*s.* Mr. W. S. Weatherley, architect, 4 Suffolk Street, Pall Mall East, S.W., or Messrs. Barrowcliff & Allcock, architects, Town Hall Chambers, Loughborough, Leics.

MAIDSTONE.—Nov. 10.—For the erection of a manual instruction room and other alterations at the Grammar school, also for new class rooms and other alterations at the Grammar school for girls. Messrs. Ruck & Smith, architects, 86 Week Street, Maidstone.

MANCHESTER.—Nov. 10.—For the supply of red terra cotta for the new Gibbon Street Council schools, Beswick; also for the new infants' school at Clarendon-road, Crumpsall. Deposit 1*l.* 1*s.* each contract, payable to the Accountant, the Education Offices, Deansgate, Manchester.

OSWESTRY.—Nov. 11.—For erection of a secondary school to accommodate 140 pupils at Oswestry, for the Salop education committee. Deposit 2*l.* 2*s.* Messrs. Appleyard & Quiggin, architects, 67 Lord Street, Liverpool.

PACKMOOR.—Nov. 7.—For erection and completion of a Council school for 400 scholars, at Packmoor, near Newchapel, North Staffordshire. Send names and 1*l.* 1*s.* deposit to Mr. Graham Balfour, Director of Education, County Education Offices, Stafford.

PORTSMOUTH.—Nov. 9.—For erection of a wall and iron fence around a portion of their land at Milton, Portsmouth, for the Guardians. Deposit 2*l.* 2*s.* Messrs. Rake & Cogswell, architects, Prudential Buildings, Commercial Road, Portsmouth.

PORTSMOUTH.—Nov. 15.—For works to be done and materials to be supplied in constructing and maintaining for six months (1) a four-stall urinal, within Clarendon Gardens and entered from Clarence Road, Southsea; and (2) an eight-stall urinal, in Goldsmith Avenue, Fratton. The Borough Engineer's Office, Town Hall.

PRESCOT (LANCS).—Nov. 10.—For erection of ironing room, in connection with the officers' laundry at the workhouse. Deposit 10*s.* Mr. James Gandy, architect, St. Helens.

ROCHESTER.—Nov. 12.—For repairs to be carried out to the river wall of the Rochester cricket field, for the Governors of Sir Joseph Williamson's Mathematical School, Rochester. Mr. R. A. Arnold, clerk to the Governors, The Precinct, Rochester.

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Ross.—Nov. 11.—For erection of a secondary school for boys and girls at Ross, Hereford. Deposit 2*l.* 2*s.* Messrs. Ashton & Small, architects, Ross.

Scotland.—Dec. 5.—For erection of the superstructure of men's barrack block, foundations and superstructures of officers' and troop stables, and band block; also making new roads and parades at the new Cavalry Barracks at Redford, near Edinburgh, in the Scottish Command. Send 10*s.* deposit by Nov. 17 to the Director of Barrack Construction, 80 Pall Mall, London, S.W., or the Barrack Construction Office at Redford, on site of works.

Seaforth.—Nov. 21.—For alterations and additions required to convert Seafield House, Seaforth, near Liverpool, corner of Waterloo Road and Shore Road, into an asylum, for the Lancashire Asylums Board. Deposit 2*l.* 2*s.* Mr. James Gornall, clerk and steward, County Asylum, Rainhill, near Liverpool.

Setmurthy.—Nov. 7.—For the various works required in erection of a house at Setmurthy, Carlisle. Send names before Nov. 7, to Mr. J. H. Martindale, F.R.I.B.A., architect, Eaglesfield Abbey Rooms, Castle Street, Carlisle.

Sheffield.—Nov. 22.—For the supply, delivery, and erection of roof principals, purlins, &c., for extensions to the engine room, boiler house, and coal store, comprising the Neepsend Generating station. Deposit 1*l.* 1*s.* Mr. S. E. Feddes, engineer, Corporation Electric Supply Department, Commercial Street, Sheffield.

Silsden.—For the mason, joiner, plumber, slater, and iron and steel works required in erection of printing works at Silsden, Yorks. Mr. James Hartley, architect, Skipton.

Skipton.—Nov. 11.—For erection of a tool house, concrete bridge and walling at the Disposal Works. Deposit 1*l.* Mr. A. Rodwell, surveyor, Skipton, Yorks.

Stockport.—Nov. 12.—For the labour and materials required in the alterations and additions to an existing shelter in Vernon Park. Mr. J. Atkinson, A.M.I.C.E., borough surveyor, Town Hall, Stockport.

Urmston.—Nov. 9.—For the erection of an elementary school at Urmston, near Manchester, to accommodate 400 children. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Wales.—Nov. 8.—The Royal National Lifeboat Institution invite tenders for the construction of a galvanised corrugated steel and timber boat-house, timber approach, and reinforced and solid concrete lifeboat slipway at Porth 'Stinian, near St. David's, Pembrokeshire, upon or adjacent to the foreshore and sea-bed thereat. Dr. W. Wilfrid Williams, local hon. secretary, St. David's, Pembrokeshire, or at the office of Mr. W. T. Douglass, M.Inst.C.E., engineer and architect to the institution, 15 Victoria Street, Westminster, S.W.

Wales.—Nov. 9.—For erection of twenty houses at Aberbeeg, Mon., for the Aberbeeg Building Co. Mr. D. J. Lougher, architect, Bank Chambers, Pontypool.

Wales.—Nov. 10.—For erection of two instructors' quarters for No. 3 battery, Monmouthshire R.F.A., at Panteg, Mon., and for additions to the drill hall. Deposit 2*l.* 2*s.* Mr. E. M. Linton, architect, Westgate Chambers, Newport, Mon.

Wales.—Nov. 10.—For executing certain builder, painter, and decorator works at Horeb Chapel, Llwydcoed, and two dwelling houses adjoining. Mr. C. H. Elford, M.S.A., architect, 31 Canon Street, Aberdare.

Wales.—Nov. 11.—For repairs to the chapels at Cefn Cemetery, for the Merthyr Tydfil Corporation. The Borough Surveyor, Merthyr Tydfil.

Wales.—Nov. 12.—For erection of new office for Master's staff and alterations to existing Master's office at Cardiff Workhouse. Deposit 1*l.* 1*s.* Mr. Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff.

Wales.—Nov. 12.—For erection of retiring rooms and lavatory for ladies at Cardiff Workhouse. Deposit 1*l.* 1*s.* Mr. Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff.

Wales.—Nov. 14.—For repairing and renovating Uchdir Congregational Church, New Tredegar. Mr. D. W. Price, Cloth Hall, New Tredegar, Mon.

Wales.—Nov. 16.—For erection of the Haverfordwest Territorial drill hall and officers' quarters. Deposit 1*l.* 1*s.* Mr. Hugh J. P. Thomas, architect, 9 Victoria Place, Haverfordwest.

Wales.—Nov. 18.—For erection of bridges at (1) Cwmllinau, in the parish of Cemmes, and (2) Rhiwsaeson, in the parish of Llanbrynmair, for the Montgomery County Council. Deposit 1*l.* 1*s.* The Clerk of the Council, Bierriew Street, Welshpool, or the County Surveyor, Music Saloon, Broad Street, Newtown.

Warrington.—Nov. 9.—For rebuilding and repairing the boundary wall of the cottage homes, Padgate, for the Guardians of Warrington Union. Messrs. W. & S. Owen, architects, Warrington.

Wolverhampton.—Nov. 12.—For proposed extensions and alterations to the Royal Orphanage. Deposit 2*l.* 2*s.* Send names by November 12 to Mr. Fred. T. Beck, architect, Wulfrun Chambers, Darlington Street, Wolverhampton.

TENDERS.

LONDON.

For enlargement of the L.C.C. Shoreditch Technical Institute, Hoxton.

Cubitt & Co.	£12,690 0 0
Smith & Sons	12,338 4 6
Holloway Bros.	12,188 0 0
Leslie & Co.	12,187 19 0
Wall	11,938 0 0
Lawrance & Sons	11,838 0 0
F. & H. F. Higgs	11,718 10 0
Kirk & Randall	11,514 10 0
Carmichael	11,425 0 0
Downs	11,104 0 0
Holloway	10,850 0 0
Patman & Fotheringham	10,789 0 0
Allen & Sons, Kilburn (*accepted*)	10,491 0 0
Architect's estimate	11,000 0 0

For erection of the remaining portion of the weather shelter, together with the construction of the necessary street refuge, on the Victoria Embankment, near Blackfriars Bridge, for the L.C.C.

Roberts & Co.	£1,742 0 0
Munday & Sons	1,682 0 0
J. & C. Bowyer	1,596 12 0
Holloway	1,589 0 0
Harding & Son	1,541 15 0
Elliott's Moulding and Joinery Company	1,509 0 0
Rowley Bros.	1,421 10 0
Johnson & Co.	1,412 0 0
Lawrance & Sons	1,401 0 0
Wall, Lloyd's Avenue (*recommended*)	1,303 10 0
Chief engineer's estimate	1,413 0 0

For structural improvement of the Moreland Street Council school, Finsbury.

Symes	£10,750 0 0
Downs	10,456 0 0
Kirk & Randall	10,252 0 0
McLaughlin & Harvey	10,229 12 1
Patman & Fotheringham	10,173 0 0
Leng	10,137 0 0
Perry & Co.	9,944 0 0
L. H. & R. Roberts, Islington (*accepted*)	9,884 0 0
Architect's estimate	10,970 0 0

For electric light wiring, &c., at the Receiving Homes, Wanstead, for the West Ham Board of Guardians. Messrs. W. & J. H. Jacques, architects, 2 Fen Court, E.C.

Jackson Bros.	£1,220 0 0
Mayfield & Co.	1,122 7 11
Electrical Installations	1,112 10 0
Simmons & Co.	1,047 10 0
Troup, Curtis & Co.	1,043 10 9
Allam & Co.	1,037 0 0
Halsey	993 18 0
Newbald & Co.	948 0 0
Johnson & Phillips	944 0 0
Smeeton & Page	938 19 0
Biggs	932 0 0
Fryer & Co.	928 15 6
Electrical and Motor Co.	918 4 0
Vaughan Engineering Installations	904 8 0
Ryan & Sons	900 0 0
Reynolds	787 0 0
Weston & Sons (*accepted*)	744 18 0

For erection of a tramway weather shelter at Stamford Hill, for the L.C.C.

Leslie & Co.	£249 0 0
Wall	220 0 0
Roberts & Co.	220 0 0
Elliott's Moulding and Joinery Company	220 0 0
Munday & Sons	217 0 0
Rowley Bros., Tottenham (*recommended*)	162 0 0
Architect's estimate	230 0 0

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LONDON—*continued.*

For erection of residence, with stores, stables, &c., at Highbury, Islington, N. Mr. G. CARTER, architect, 513 Holloway Road, N.

Lowns & Sons	£3,080
Brown & Sons	3,047
Patman & Fotheringham	2,963
McCormick & Sons	2,950
Weidking & Co.	2,790
Monk	2,680
Mattock & Parsons	2,622
Architect's estimate	2,750

For the erection of a police section house at Commercial Street. Mr. J. DIXON BUTLER, F.R.I.B.A., architect, surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Treasure & Son	£12,975
Harris & Wardrop	12,963
Clarke & Bracey	12,939
Shurmur & Sons	12,893
Fairhead & Son	12,820
Ashby & Horner	12,625
E. Lawrence & Sons	12,378
Roome & Co.	12,289
Patman & Fotheringham	12,243
Lovatt	12,227
Prestige & Co.	12,211
Maddison	12,186
Killby & Gayford	12,173
Mowlem & Co.	12,112
Lole & Co.	12,111
Godson & Sons	12,087
Blake	11,975
W. Lawrence & Son	11,942
Grover & Son	11,883
Sabey & Son	11,720

MORLEY.

For erection of workshops, stores, offices, foundries, tall chimney, and gas plant, in Texas Street. Mr. T. A. BUTTERY, architect, Morley and Leeds.

Pearson & Ainsmith, mason and bricklayer	£2,345 0 0
Newton, carpenter and joiner	2,290 0 0
Lambourn & Co., ironfounder and steel work	1,530 0 0
Spensly, concrete work	1,100 14 7
Kellett, slater	584 9 0
Stakes, plumber	258 0 0
Rhodes & Sons, plasterer	244 13 11
Heywood & Co., patent glazing	230 0 0

SALISBURY.

For building sanitary blocks to the infirmary, bathrooms, and alterations to latrines. Messrs. JOHN HARDING & SON, architects, Salisbury.

Wort & Way	£1,397 10 0
Dawkins	1,298 0 0
Roles & Sons	1,218 0 0
H. TRYHORN, Salisbury (*accepted*)	1,141 14 7

SEAFORD.

For the supply and erection of a two-cell destructor and boiler at the sewage-pumping station. Messrs. POLLARD & TINGLE, engineers, 31 Old Queen Street, Westminster, S.W.

Horsfall Destructor Co.	£1,541 0 0
Goddard, Massey & Co.	1,456 0 0
Heenan & Froude	1,210 0 0
Manlove, Alliott & Co.	1,179 0 0
Hughes & Sterling	1,032 15 0
MELDRUM BROS. (*accepted*)	991 0 0
Dawson & Manfield	953 0 0

SUNNINGDALE.

For additions and alterations to "Hillside." Messrs. ROBERTS & SMITH, architects and surveyors, Sunningdale.

Harrods	£2,880 0 0
Wakelin	2,258 0 0
Charman	2,196 0 0
NORRIS & Co. (*accepted*)	2,090 0 0

UXBRIDGE.

For new elementary school, Cowley Road, Uxbridge, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the Education committee.

Fassnidge & Son	£6,213 0 0
Treasure & Son	5,850 0 0
Kearley	5,730 0 0
Stewart	5,613 0 0
Dorey & Co.	5,597 0 0
Dickens	5,587 0 0
Knight & Son	5,582 0 0
Monk	5,539 0 0
Bollom	5,521 0 0
Lawrence & Son	5,342 0 0
Mattock Bros.	5,277 0 0
Brand, Pettitt & Co. (*recommended*)	5,179 0 0

WALES.

For the erection at Swansea of the following works, for the Glamorgan County Territorial Force Association: Headquarters block, for six units, with officers' mess; riding-school, 150 feet by 53 feet 6 inches, with stable, magazine, and yard; drill-hall, 150 feet by 80 feet, with caretaker's cottage, lavatories, and miniature rifle range; re-erection of existing gateway, new entrance. Mr. C. H. ROGERS, architect, Swansea.

	With Tower.	Without Tower.
Thomas & Sons	£13,573 16 4	£13,402 3 9
Waring, Cole & Waring	13,095 2 10	12,781 13 10
J. & D. Jones	13,025 0 0	12,871 0 0
Davies	13,000 0 0	12,643 0 0
Lloyd Bros.	12,995 0 0	12,825 0 0
Bloxham	12,760 0 0	12,600 0 0
Blake	12,500 0 0	12,347 0 0
Jenkins	12,400 0 0	12,230 0 0
Stephens, Bastow & Co.	12,292 0 0	12,147 0 0
Bennett Bros.	12,150 0 0	12,026 0 0
Davies & Son	12,120 0 0	11,988 0 0
Pye, Parkinson & Co.	11,948 19 0	11,837 19 0
Spencer, Santo & Co.	11,943 0 0	11,836 0 0
Marles & Son	11,895 0 0	11,762 0 0
Walters & Son	11,887 0 0	11,687 0 0
Williams	11,881 0 0	11,739 0 0
Vaughan	11,707 0 0	11,571 0 0
Billings	11,700 0 0	11,525 10 0
J. & F. Weaver	11,500 0 0	11,375 0 0
W. & J. R. Watson	11,357 0 0	11,229 0 0
Parkinson & Hodgens, Swansea (*recommended*)	10,939 14 9	10,796 18 0
Architect's estimate	11,700 0 0	—

For erecting laundry and stables, for the Tredegar and District Laundry Co., Ltd. Mr. A. F. WEBB, architect, Blackwood.

Morgan	£2,190 15 0
Rutter	2,186 5 9
Davies & Sons	2,080 0 0
Williams	1,990 0 0
Spencer, Santo & Co.	1,968 0 0
Edwards	1,960 0 0
Kirby & Westacott	1,881 0 0
Gregory Bros.	1,809 0 0
PODDEN, Pengam (*accepted*)	1,750 0 0
Colborne	1,749 9 0

WORTHING.

For erection of the first portion of Immanuel Church, Worthing, to serve as a temporary church. Mr. FREDERIC R. FARROW, F.R.I.B.A., architect. No quantities.

Snewin & Son	£700 0 0
Patching & Co.	685 0 0
Sandell & Sons	630 0 0

THE Newport Corporation Works Committee have instructed their engineers to prepare a report on the question of providing a lattice-work bridge at Frederick Street and Albion Street to supersede the present structure.

THE reports of the Scotch Royal Commission on Registration of Title were considered at a meeting of the Scotch Law Society held in Edinburgh at the end of last week. In the result a resolution was passed inviting the Scottish Office to appoint a committee with a view to suggesting improvements in the existing system of conveyancing in Scotland. The reports are read as condemnatory to a system of registration of title being extended to Scotland.

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BRITISH EXHIBITORS ABROAD.

PUBLIC attention may now be called to what has been already accomplished by the Exhibitions Branch of the Board of Trade. The work has been carried out quietly and unostentatiously, and perhaps for that very reason has been all the more effective. An organisation has been created capable of dealing with any number of exhibitions at which it is decided that it will be for the benefit of British trade to be represented. The trades and industries of Great Britain and Ireland which have any chance of extending their business in the country visited are first made aware of the possibilities in this respect, and then are given an opportunity of purchasing space at extremely moderate prices.

Having packed their materials, would-be exhibitors find there are special rates for carriage by rail and sea. At the Exhibition gates the British authorities take charge of their packing-cases, assist with unskilled labour in unpacking, provide beautiful stands, and even "dress" the exhibits on the most up-to-date and artistic lines if asked to do so. Suitable colour schemes are arranged for the different buildings, and every effort is made to insure *not only* that the exhibitors obtain the best results, but that each stand contributes to make the whole effective. In addition, contracts are made for the supply of gas, water and electricity. The packing-cases are stored during the "run" of the Exhibition, the firms are assisted to re-pack at the close, and in those instances in which they do not sell their exhibits they have special transport facilities for the return of what has been unsold. Exhibitors are given the benefit also of whatever special trade knowledge is at the disposal of the Government, and a room is provided for their use.

There are no extra fees demanded after payment for space; the exhibitor gets the full benefit of all the business he secures, and that benefit, judging by past experience, not infrequently extends over a long series of years.

At the Brussels Exhibition, which is now drawing rapidly to a close, those who took the opportunity of re-exhibiting after the terrible conflagration in August report splendid returns. One exhibitor has declared that, although owing to the fire the best month in the year was lost, his takings are better up to date than they have been for any previous international exhibition. Another has stated that 1,000*l.* profit has been made apart from the probability of "repeat" orders in the future. In regard to heavy machinery it is understood that the number of inquiries has been most satisfactory. In view of the fire the individual results have been astonishingly gratifying. But the combined result has been still more so. In comparison with the number of firms taking part, the proportion of Grands Prix, Diplomas of Honour, gold, silver and bronze medals has been unprecedented, and therefore the advertisement gained for British trade excellence and enterprise has been of the utmost value. New centres of business have been tapped by this country, and new business connections created. Furthermore, the manner in which in a few weeks the new British Section was brought into existence after the conflagration has been of great value apart from trade. It has awakened the world to the fact that British resource and enterprise are not dead, and at the same time the spirit of good fellowship shown in undertaking such a task has aroused a profound feeling of sympathy on the Continent.

While, however, the Exhibitions Branch of the Board of Trade were looking after British interests in Brussels, they were taking part both in the Vienna Exposition and in the Argentine Centenary Celebrations in Buenos Aires. In the Austrian capital the British Section represented a quaint old Cheshire house, and contained numbers of interesting trophies.

At Buenos Aires the Government has participated in four distinct exhibitions, which formed part of the great Centenary Celebrations. These respectively dealt with railway and land transport, hygiene, agriculture, and fine arts.

In the case of the first-mentioned, which has been productive of much excellent business, Great Britain occupied a space of approximately 29,000 square metres, which was in excess of the combined German, Italian, United States, Austrian, French and Belgian Sections; that is to say, this country controlled more than half the entire exhibit area. We also held 5,000 square metres of space in the Hygiene Exhibition, while in the Fine Arts Exhibition the British Section is acknowledged to have been by far the most important and most frequented. More than 50 per cent. of the pictures shown, it is estimated, will have been sold by the time the buildings are closed.

In each of the exhibitions named the British exhibitor appears to have been well rewarded for his enterprise. Never before has he been enabled to exhibit under conditions so advantageous. For the first time in the history of this country he has had at his disposal a Government organisation which almost entirely relieves him of anxiety and responsibility. To the fullest extent possible his interests are safeguarded.

The fact that official participation in these exhibitions is not sanctioned until it is clear there is an immediate likelihood of Britishers securing distinct commercial advantage from a display of their goods, as well as the record of results already obtained, should in future prove to be a great incentive to the best firms to take part in similar enterprises under Government control. More particularly should this be the case with regard to the approaching Turin Exhibition, for from Consular and other reports received it is evident the Italian market is full of promise for the English, Irish and Scotch manufacturers.

USE OF WATERFALLS IN SWEDEN.

H.M. CONSUL at Stockholm (Mr. H. M. Villiers, M.V.O.) has forwarded copies of two official reports on the exploitation of the Swedish waterfalls, from which the following particulars are taken:—

The total water-power in Sweden is estimated at approximately 10,000,000 h.p., available during from six to nine months of the year, and 2,500,000 h.p. available during the time of low water. Of this amount 75 per cent. is in North Sweden, 15 per cent. in the province of Svealand, and 10 per cent. in Göteland. In the near future 600,000 h.p. will be in use, including 340,000 h.p. for the generation of electrical energy.

At the present time the State possesses, or is part proprietor of, waterfalls of about 880,000 h.p., of which 670,000 h.p. could be used without previous regulation of the respective waterfalls. Only 63,000 h.p. is now in use by the State, including some 40,000 h.p. at the power station at the Trollhättan Falls. Work is now in progress at Trollhättan by which a further 40,000 h.p. may be used there. At the great Porjus Fall on the Lulea River, in Lapland, a power station is to be erected with a capacity of 50,000 h.p. In addition the Swedish Government proposes to set up works at Alfkarleby, in Upsala län, Uppland, and at other places.

Preparations are in hand with a view to utilising the waters of Lake Waner and Lake Siljan. The Government is also turning its attention to the use of the water-power in the centre and south of Sweden for working electric railways, and has to this end purchased waterfalls at a cost of about 280,000*l.* If the electrification of the line on the northern Swedish boundary proves satisfactory, electric traction will be extended further, and eventually to the whole of the State railways.

For the purpose of the better exploitation of the waterfalls important extensions have been made in recent years in the means of communication in Sweden. The falls in the upper Lulea River are to be rendered accessible by the construction of a railway from Gellivare to Porjus. The Trollhättan Canal also is being made capable of taking vessels drawing 4-5 metres (13-16½ feet), at a cost of about 1,280,000*l.*

The present law as to the right of disposal of waterfalls is stated to be out of date and unsatisfactory, and the Waterfalls Commission is preparing a draft for a more suitable law.

THE INSTITUTE OF METALS.

THE annual general meeting of the Institute of Metals will be held at the Institution of Mechanical Engineers, Storey's Gate, S.W., on January 17 and 18, 1911. At this meeting a number of interesting papers will be presented, including some of an essentially practical character, together with the "Preliminary Report to the Corrosion Committee." It will be remembered that this committee was appointed some months ago to investigate cases of corrosion of the non-ferrous metals. The preliminary report will show the present state of knowledge of the corrosion of non-ferrous metals and alloys, and will contain suggestions for a research into the causes of the corrosion by sea water of brass condenser tubes.

To take place in the afternoon of January 18 there has been arranged a visit to the works of the Thames Ironworks and Shipbuilding Company, Ltd., where an opportunity will be afforded members of inspecting H.M.S. *Thunderer*, the new Dreadnought which is in course of construction in the company's yard at Blackwall.

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In view of the success of the first annual dinner, which was held in January last, the Council has decided that there shall be a second annual dinner, to take place on the evening of January 17, the first day of the annual general meeting. The dinner will be held, as before, at the Criterion Restaurant.

There are, doubtless, many persons who are considering the question of joining the Institute of Metals, and who would like to take part in the above meeting as full members. The last date for the receipt of applications for membership is November 22. Already there is a large number of candidates awaiting election, and it is expected that the next ballot list will be of record length.

The Institute has now been founded just two years, and has celebrated its birthday by becoming an incorporated institution. The Institute is now admitted to be firmly established and to be doing really useful work, and therefore it is anticipated by the Council that there will be a large increase of the membership before the annual general meeting.

The Secretary of the Institute of Metals, Mr. G. Shaw Scott, M.Sc., Caxton House, Westminster, S.W., will be glad to forward membership application forms and full particulars regarding its work.

THE PANAMA CANAL.

A British Consular report on the trade of the Republic of Panama states that on May 3, 1910, the sixth year of American canal construction ended, and it is confidently anticipated that the canal will be completed before January 1, 1915. The estimate of the cost of the canal when completed now stands at $375,000,000, which is largely in excess of the original estimates. The entire length of the canal from deep water in the Atlantic to deep water in the Pacific is about fifty and a half miles. A vessel entering from the Atlantic will follow a dredged channel, 500 feet in width, for seven miles to Gatun, where it will enter a series of three locks in flight, and be lifted 85 feet to a lake of 164 square miles in area, created artificially by damming the Chagres River and other streams, effected by means of the Gatun dam, an earthwork nearly one and a half mile long, half a mile wide at its base, and about 100 feet wide at the top. The vessel will be able to move at full ocean speed through Gatun Lake, in a channel varying from 1,000 feet to 500 feet in width, for a distance of about twenty-four miles to Bas Obispo, at which place it will enter the Culebra Cut, where the continental divide has been pierced by excavation. The channel through the cut is 300 feet wide at bottom, and extends nine miles to Pedro Miguel, where the vessel enters a lock and is lowered 30 feet, reaching sea-level again through two locks in series at Miraflores, whence it passes out into the Pacific through a channel about eight and a half miles in length.

The total excavation as originally planned was estimated at 103,795,000 cubic yards, in addition to the excavation by the French companies, but changes in the plan of the canal increased the amount to 174,666,594 cubic yards. Active excavation work on a large scale did not begin until 1907, and up to the end of 1909 94,969,387 cubic yards had been removed. The building of the locks at Gatun and Pedro Miguel was begun during 1909, and the construction of the dam is steadily proceeding. The labour employed on the canal is nearly 39,000, of whom some 5,000 are Americans, 5,000 are European labourers (mostly Spaniards), and of the remainder 28,000 are West Indians, almost entirely British subjects.

COLONIAL SURVEY APPOINTMENTS.

The Secretary of State for the Colonies has approved of certain new arrangements for the selection of candidates for junior survey appointments in Crown Colonies and Protectorates.

Candidates must be between the ages of twenty-one and twenty-seven, and should be unmarried. Applications should be made in writing to the Private Secretary to the Secretary of State, Colonial Office, London, S.W.

A candidate not exempted for reasons given below will be required to pass two tests:—(*a*) A qualifying examination in mathematics, including algebra, geometry, and plane and spherical trigonometry, and (*b*) a qualifying examination in the use and adjustment of surveying instruments. This examination will include the theodolite, level, compass, chain, tape, plane table, clinometer, and barometer. It is not, however, necessary that the candidate should have had other than academical experience of the use of these instruments.

A candidate who has passed with honours in mathematics, physical science, or engineering, or who has obtained an equivalent diploma or distinction in a University or school of a University in the United Kingdom, or who has been licensed to practise as a surveyor in one of His Majesty's dominions, will not be required to undergo any technical or educational test.

A candidate who has passed the examination for the Associated Membership of the Institute of Civil Engineers or for the Professional Associateship or Fellowship of the Surveyors' Institution, or who has obtained the surveying diploma of the Royal Geographical Society, will be exempt from the technical test referred to in paragraph (*b*) above.

According to the number of vacancies successful candidates will be sent to the Ordnance Survey Office, Southampton, for a course of instruction not exceeding two months. If reported on favourably, a candidate will become a survey probationer and will be granted the amount of his actual travelling expenses incurred in connection with the course, and a lodging allowance of 2*s.* 6*d.* a day and a subsistence allowance of 5*s.* a day for each day spent at Southampton.

A survey probationer will be sent out to the colony or protectorate to which he is posted at a salary of 250*l.* a year, with free quarters, or an allowance in lieu thereof when stationed at headquarters.

At the end of one year he will, if approved, be appointed to the Department at the ordinary rate of pay attached to junior survey appointments, for three or five years in the first instance, with a prospect of re-engagement if the surveyor's service continues to be satisfactory.

The rates of salary payable after the expiration of the period of probation are as follows:—Ceylon.—Assistant superintendent of surveys, 300*l.* to 350*l.* a year by annual increments of 10*l.* Federated Malay States.—Second-grade surveyor, 300*l.* to 360*l.* a year by annual increments of 15*l.* East Africa and Uganda.—Junior staff surveyor, 250*l.* to 280*l.* a year by annual increments of 15*l.*

COMMONS AND FOOTPATHS PRESERVATION SOCIETY.

Lord Eversley presided over the monthly meeting of the Commons and Footpaths Preservation Society held last week at 25 Victoria Street, Westminster. Representatives were appointed to a forthcoming conference convened to consider the Society's Public Right of Way Bill, the object of which is to simplify the method of proving whether disputed footpaths are public. It was announced that resolutions in support of the Bill had already been passed by individual councils and bodies representing over three-fourths of the Highway Authorities in England and Wales. The Secretary, Mr. L. W. Chubb, stated that a large number of applications had been received from landowners in all parts of the country who desired technical advice in complying with the requirements of Form IV. in regard to common lands and public rights of way. The Society decided to invite the other Open Space Organisations to combine with it in issuing a circular recommending that, where necessary, village memorials of the late King's reign should take the form of the provision of recreation grounds or other open spaces. It was also decided to invite kindred societies to make a united protest against the fencing in of over an acre of Hampstead Heath to form a rubbish tip.

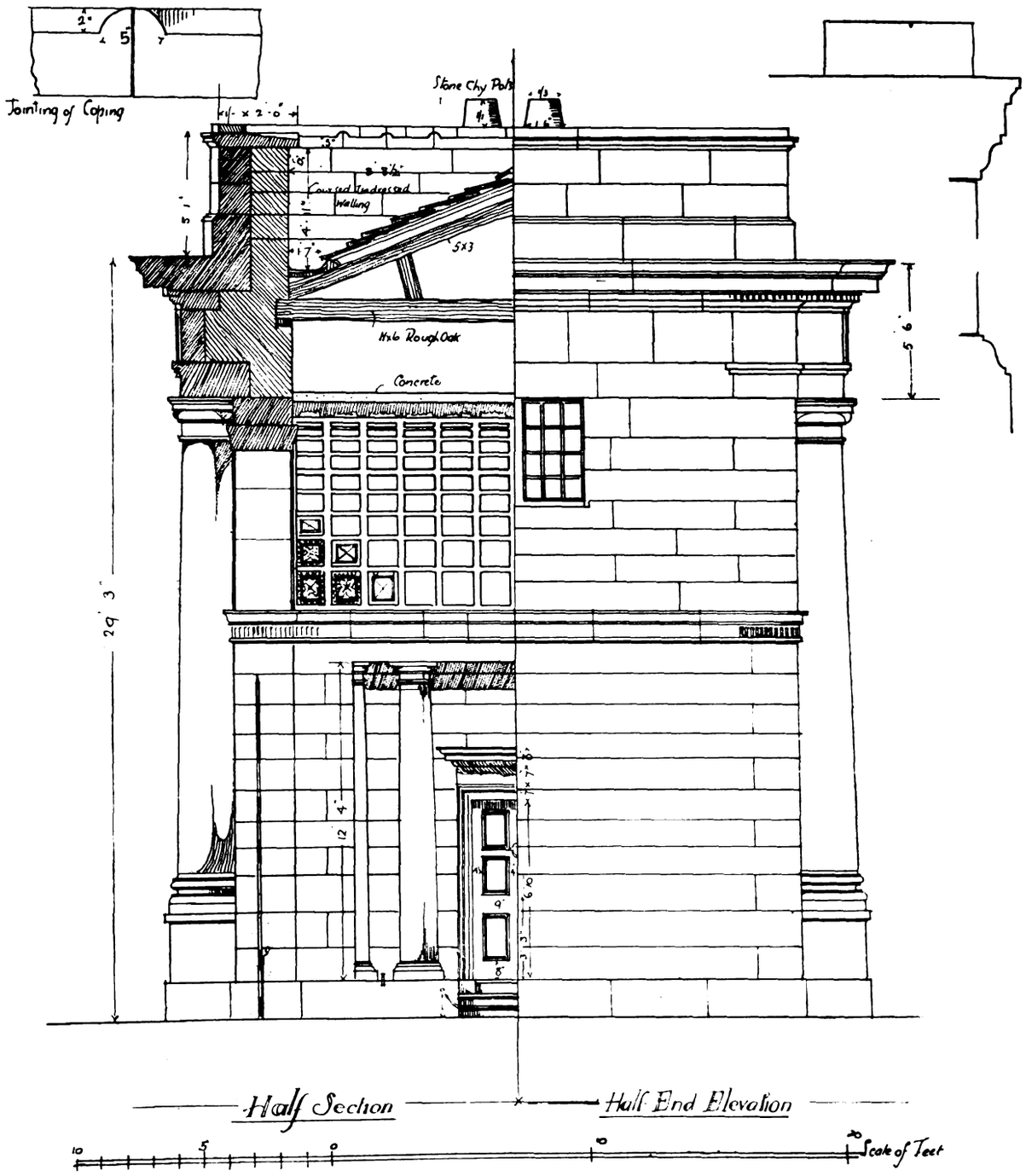
The Estates Committee of the Birmingham City Council last week approved plans for the erection of a block of buildings at the corner of Corporation Street and Steelhouse Lane opposite the General Hospital. If the committee possess the legal power, a public clock will be provided for the principal building with a dial at least 6 feet in diameter.

Official details have been given to the Aberdeen Town Council as follows of the estimate for the proposed modified Avon water supply scheme:—Compensation reservoir and intake works in Avon valley, 100,000*l.*; tunnels and masonry conduits, 104,211*l.*; cast-iron mains, 463,086*l.*; roads, 25,156*l.*; repairs to roads for extra traffic, 25,000*l.*; buildings, temporary works, telephone, &c., 9,000*l.*; service reservoir at Wardhead, 50,000*l.*; lands, servitudes, way-leaves, &c., 65,000*l.*; total, 841,453*l.*

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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

ENTRANCE. GATEWAY. HAREWOOD. HOUSE.



MEASURED AND DRAWN BY "LOIDIS."

MEASURED DRAWINGS OF THE ENTRANCE GATEWAY, HAREWOOD HOUSE, YORKSHIRE.

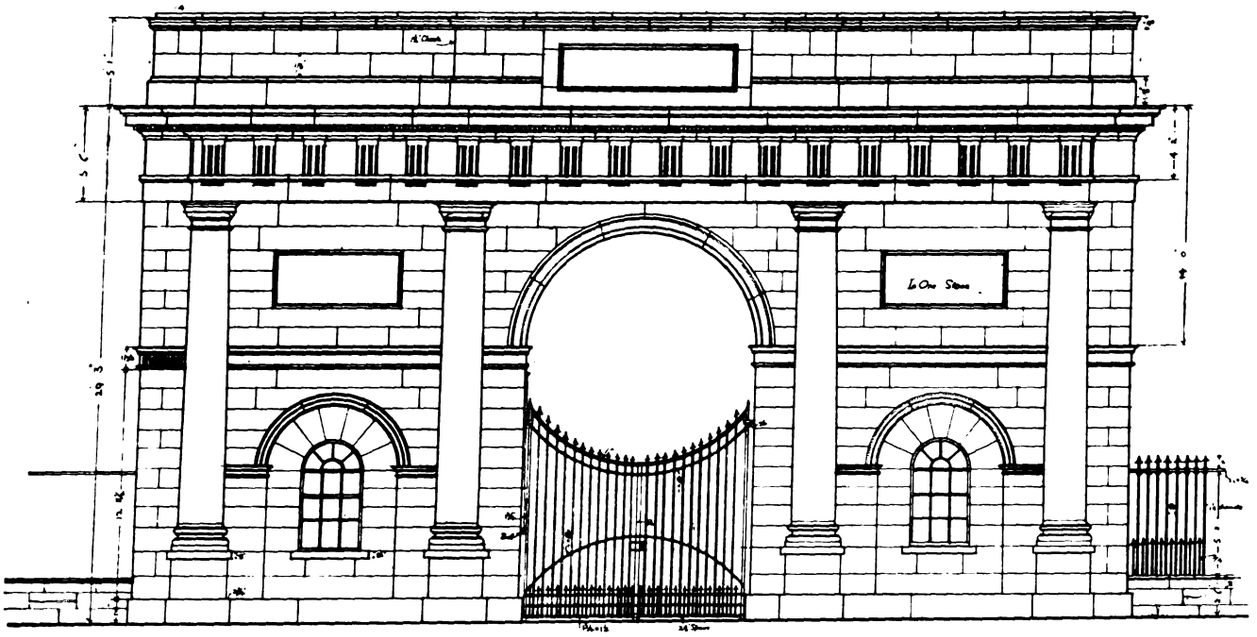
THE entrance gateway to Harewood House was erected for Mr. Edwin Lascelles between A.D. 1780 and 1800, by John Carr, architect, of York (b. 1723, d. 1807), but the pavilions were not completed until the middle of the year 1801. It is probably one of the finest if not the finest architectural composition designed by Carr. The whole lay-out is very clever, and has qualities that remind one of Vanbrugh's wonderful scenic architecture. The curved wings to the open space in front of the gateway itself generally strike one at a cursory glance to be semicircular in plan, but a glance at the layout plan submitted herewith shows that it is bell-shaped. The pavilions abutting on to the village street are beautifully designed, the detail being extremely fine and the proportions good. From the pavilions there is a length of straight wall on each side with cornice and blocking course, surmounting a frieze divided up with triglyphs with very wide metopes, and finishing against a stone pier with moulded cap surmounted by a carved supporter of the Harewood Arms.

The gateway is designed on the lines of a Roman triumphal archway with a central barrel vaulted archway decorated with a moulded and enriched coffering worked in cement or stucco duro. On each side of the archway, and opening from it are two lodges consisting of living room with two bedrooms over.

The Doric order is used on each of the long façades (both exactly alike), the cornice being denticular, with cavetto crowning mould, decorated soffit to the corona, and denticular bed mould. The frieze has channelled triglyphs and plain metopes, taenia fillet, guttae and guttae tablet. The architrave is plain on face, but is enriched on its soffit by a running pattern founded on the guilloche. The caps have

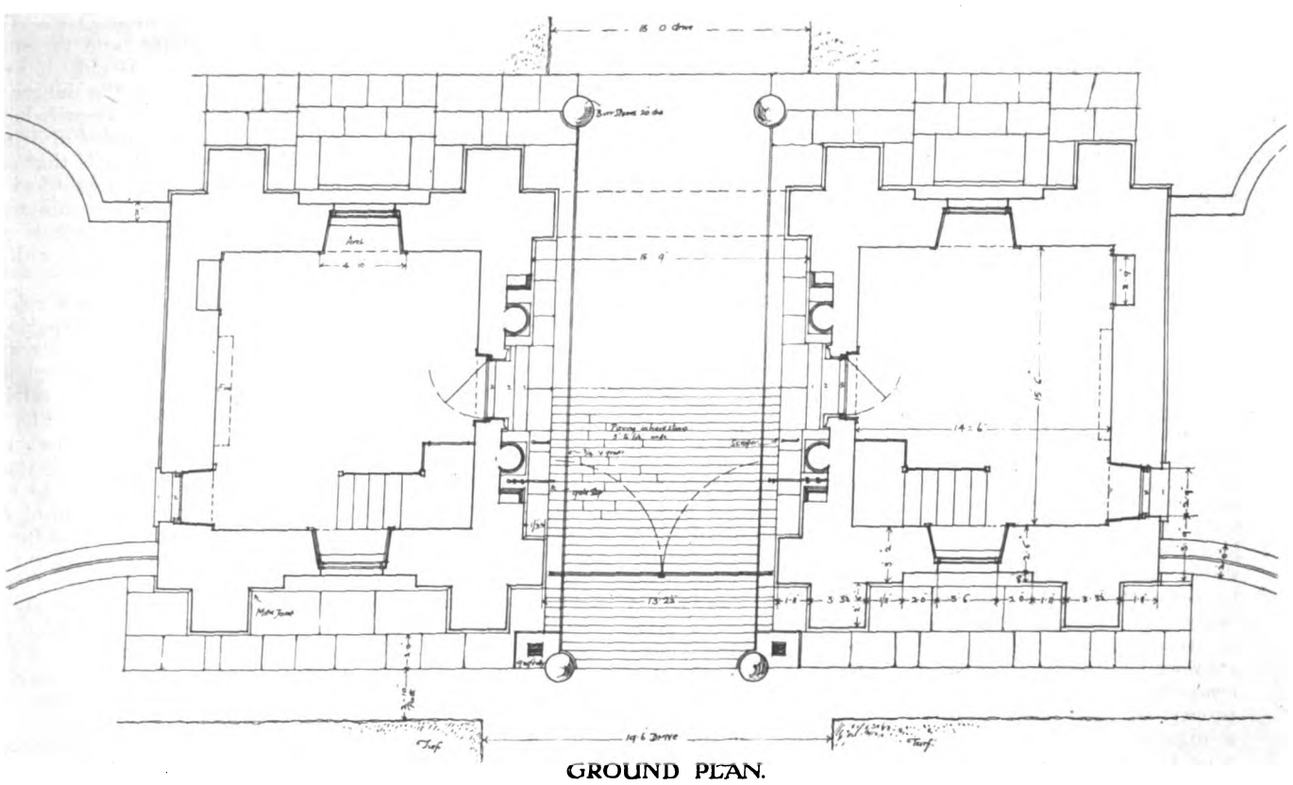
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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.



ELEVATION.

ENTRANCE GATEWAY, HAREWOOD HOUSE, YORK.—JOHN CARR, Architect.



GROUND PLAN.

Scale of Feet.

MEASURED AND DRAWN BY "LOIDIS."

the usual members and the base is the ordinary Roman attic base. The columns, which are each in one stone, are eight diameters high; those under the archway are more graceful and have caps with quite a Grecian feeling in the outlines of the moulds, the echinus being a replica of the one at the Temple of Hercules at Cori, and the base consists of the double torus with the usual scotia mould omitted. The string impost and arch mouldings are very delicate in outline, and show the influence Robert Adam had upon Carr's work.

The windows have semicircular heads with square reveals enclosed within an outer semi-circular arch with moulded architrave, a very favourite feature of Carr's.

The buildings are erected of finely tooled close-grained sandstone, yellow ochre in colour, in large stones with joints not more than $\frac{1}{8}$ inch in thickness. The columns are in one stone from the top of the apophyge of the bases to the top of the necking mould of the capitals.

The moulds are beautifully finished, clean cut, and mitres accurately worked. The coffering to the archway is of cement or stucco duro, moulded and enriched with the egg and tongue and acanthus leaves.

The gate is of wrought iron, with arched top and stays. Around the gateway is a border of flagstone paving with 20 inches diameter burr stones on each side.

The paving to the archway is of finely jointed hardstone from $5\frac{1}{2}$ to 6 inches in width, and from a foot to 30 inches long, finished with a $\frac{3}{4}$ inch V-cut groove channel to carry the water away.

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ALTERNATIVES TO THE USE OF WHITE LEAD.*

THERE are few pigments that have such a long and honourable record of usefulness behind them as white lead. It was some considerable time before the dawn of our era that painting received a great impetus by the discovery of this substance, and through the Middle Ages down to our own time white lead has been the staple white pigment for painters of every kind and degree.

One cannot but admit that in many ways it is a magnificent pigment. It covers well, it is of a fine colour, and it works most beautifully in the brush. In the good old days, in fact, everybody was satisfied with white lead: in the first place, there was nothing else to be had, and so it was a case of necessity. Moreover, the conditions of life and work were totally different to those that prevail at the present time: the population was comparatively small, and was more scattered in villages and small towns; life was simpler, and the air even of the towns was comparatively pure. Death and disease in those days were taken *more* as a matter of course, and were *not* so resolutely fought by that devoted army of medical men which is the glory of our present civilisation. If a man met with an accident or illness in the course of his employment, nobody worried over it. But in our times the spread of democracy, the great growth of the population, the constant migration to the large towns, and the enormous consumption of coal, with consequent serious contamination of the air, has daily brought into greater prominence the fact that white lead, satisfactory as it is in many ways, is by no means an ideal material for the use of the painter. The drawbacks incident to its use are well known to you, and may be scheduled thus:—

(1) White lead is a poisonous substance.

(2) It does not retain its colour in impure air.

(3) Paint prepared from it rapidly "chalks" and disintegrates on exposure.

I *do not* propose to enter upon any discussion of these points in detail. The question as to how far lead poisoning is a necessary corollary to the use of white lead, and how far it is due to wanton carelessness on the part of the painter, is a fruitful subject of controversy, upon which each of us no doubt has his opinion. But any such controversy is entirely outside the scope of this paper. I think I can fairly ask even the most ardent advocate of white lead to agree with me that white lead has poisonous properties, and to let the matter stand at that.

Neither do I propose to pay any attention to what we may term the accidental properties of white lead; that is to say, such qualities as differentiate one particular brand of white lead from another. There are, as you know, many different methods of preparing white lead, and the product may vary to a certain extent according to the process by which it is made. The product of one firm may be superior in colour to that of another, and so on. But all this is beside the point. In all that follows when I speak of white lead I want you to understand the definite chemical substance known to chemists as basic carbonate of lead, made by the best standard process, whatever that may be. A badly made white lead may differ from one properly made in its physical properties—its colour, its covering power, its working qualities, and so on—but as a definite chemical compound it must always have certain definite chemical properties. The point is that the defects of white lead as a pigment, which I have scheduled above, are dependent upon these chemical properties, and the best white lead that ever has or ever can be made must of necessity possess them. The endeavour to overcome the difficulties attendant upon these unfortunate drawbacks to the use of white lead has, therefore, of necessity extended in the direction not merely of improving its manufacture, but of producing some substance of entirely different chemical properties and, therefore, free from these defects, which at the same time possesses those physical properties which make white lead so valuable as a pigment.

Many people are sceptical as to the possibility of using anything in place of white lead; notwithstanding its drawbacks, they cling to the belief that it is the one and only white pigment for the painter. Considering the good record of long service it has behind it, I can understand this attitude, and sympathise with it up to a certain point. The conservatism of the painter has been made the butt of much ridicule in recent years, but, after all, there is a good deal of common-sense in sticking to a well-tried article until you are quite sure you have found something better. Any business man knows the havoc that may be caused by ill-considered change. But such trouble is nothing to the effect of the dead-rot that attacks a firm which blindly follows the old trail, refusing to consider the possibilities of improvement. Caution is a totally different thing to prejudice, although they only too frequently go hand in hand, and in your own interests I would urge you to examine this question fully and satisfy yourselves as to the facts. To this end I propose to bring before you the claims that other white pigments have upon your attention as paint materials, and to examine how they compare and contrast with white lead.

It will materially assist us in our inquiry to examine a little more fully the chemical properties of white lead, to which I have drawn attention, and see how it comes about that it possesses these properties. In the first place, white lead is poisonous because it is capable of being absorbed by the human system, and no substance which is not required by the natural working of that system can be introduced into it without upsetting its working. Sometimes this may be done with advantage if you can add some substance which will upset it in a known way, and you call such a substance a medicine. But it is a well-known paradox that many substances which form valuable medicines become virulent poisons if used to such an extent that they act beyond the calculated amount. The manner in which such substances affect the body does not concern us, but what I want to make clear is that in order for a substance to have any effect in this way the solvents provided in the body for the purpose of digestion must be able to dissolve it. Any substance which is quite insoluble in these juices will pass through the body without being absorbed, and cannot therefore affect it. The trouble with white lead is that it *is* soluble, and therefore can be absorbed and cause lead poisoning. If only it were more insoluble this would not happen. Now the danger of lead poisoning can, as you know, be to a great extent reduced if you can persuade your painters to make a habit of drinking dilute sulphuric acid. What happens then is that any white lead that may be inhaled or swallowed is attacked by the sulphuric acid and converted into another substance, known as lead sulphate, which the digestive agents are unable to attack, and which therefore passes away without affecting the system.

Passing to the next point, white lead changes colour, ultimately becoming black, *in town air*. It is capable of being attacked and dissolved by the digestive juice because it is a compound of a very weak acid, easily decomposed, and for this same reason it is readily attacked by the sulphur compounds present in impure air, with the ultimate formation of lead sulphide, which is black. It is well known that if white lead that has gone off colour in this way is exposed to bright sunlight it gradually regains its colour to some extent. This is due to the fact that the sulphide of lead under the influence of sun and air is capable of a further change, combining with the oxygen in the air to form sulphate of lead, which is again white. Lastly, the "chalking" and general decay of white lead paints is partly due to the fact that it reacts with the vehicle with which it is mixed, and partly due to the same cause as its other defects, that the white lead itself is decomposed by atmospheric action. Here again we find that the result of decomposition is the formation of sulphate of lead, because sulphuric acid is one of the commonest impurities in the air of our cities.

I have briefly reminded you of these well-known facts in order first of all to make it clear that the disadvantages of white lead are due to its chemical properties, and that no pigment can be considered as an adequate alternative which is not superior to it in the way of resistance to chemical change. Secondly, however, I want you to notice that the remedy for each trouble results in the formation of sulphate of lead. Why not use sulphate of lead, therefore, in place of the carbonate of lead known as white lead? is the question that naturally rises to our mind. It is non-poisonous because it is insoluble; it is white and not affected by sulphur, being already fully saturated with it; and it is chemically stable. The sulphate of lead formed by any of the reactions I have described, however, is of no use as a practical pigment, as, although it is all right from this point of view, it is equally deficient in those properties which render white lead valuable, having, for instance, very little opacity or covering power. But it has been found possible to get over this difficulty by modifying the composition somewhat. Not to weary you with details of the chemistry of its composition, this modified sulphate of lead is known to chemists as basic sulphate of lead, and this substance is the

* A paper by Mr. Noel Heaton, B.Sc., delivered before the National Association of Master Decorators at the Convention at Newcastle.

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first practical substitute for white lead to which I wish to draw your attention. Although the merits of this pigment are well recognised, especially in America, where it is produced in large quantities, it is very little known in this country. It has been manufactured over here on a comparatively small scale for many years, but for some reason has never yet managed to secure a firm footing amongst painters in general. One difficulty with this pigment is that of providing it with a satisfactory trade name which will sufficiently indicate its character without confusing it with white lead. In America it is generally known by the rather unsatisfactory title of sublimed white lead, from the fact that it is produced direct from the lead ore, galena. By heating this to such a temperature that it vaporises, and allowing the vapour so formed to come into contact with air, the pigment is obtained in a state of extremely fine division fit for immediate use. The simplicity of this process, now that it has been worked out to the extent of being carried on continuously and automatically, enables the pigment to be produced at a price comparing very favourably with that of white lead.

The quality of the pigment depends to a certain extent on that of the ore from which it is produced, although the majority of the impurities in the latter do not affect it, as, not being volatile, they remain behind in the furnace. Lead ores, however, almost invariably contain a small amount of zinc, and this volatilises with the galena so that the commercial pigment generally contains a small quantity of zinc oxide, which, however, as we shall see, is no disadvantage. I think I have already made it clear that this pigment is free from the great drawbacks of white lead. It is a compound of great stability, and is sufficiently insoluble to be comparatively non-poisonous. I am not prepared to claim for it that it is as absolutely harmless as such substances as chalk or barytes; given sufficient carelessness and bad management it is possible to get lead poisoning with it, but careful investigations have shown that the toxic effect is at the most one-sixth that of white lead.

But what you want to know as practical men is how it compares with white lead from the practical point of view. Well, first of all, in colour it generally has a very slight yellow cast when compared in bulk with the very finest white lead, but this is not sufficient to be noticeable when it is made up into paint. This, by the way, may be looked upon as what I had termed an accidental defect—that is, one that may be eradicated in course of time by improvements in the manufacture, just as the colour of white lead has undoubtedly improved during the past twenty or thirty years. In fact, recently a certain firm sent me for investigation a specimen of artists' colour which was being introduced into this country from abroad and which was quite equivalent both in colour and working to any flake white that I have ever seen. On examination I found that the pigment was nothing but this basic sulphate of lead. The opacity or covering power of this pigment is equivalent, if not superior, to that of white lead, and leaves nothing to be desired, and whilst it is not quite such a good drier as white lead it gives no trouble on this score. In fact, the only criticism that can be passed upon it by the practical painter is that it does not work in the brush in exactly the same way as the white lead to which he is accustomed. This is perfectly true; compared with this pigment the particles of white lead are coarse and irregular and, owing to its exceeding fineness and uniformity of grain, sublimed lead is much more bulky than the same weight of white lead. Consequently, if one mixed it with oil in just the same manner as one would white lead, it is too thin. Once this is realised, a little experience soon gives one the knack of mixing it correctly, and when properly prepared it forms an exceedingly smooth-working paint. This, again, has led to prejudice against it on the part of the painter accustomed all his life to handle white lead; it spreads so freely and evenly as compared with white lead that the tendency is to work it out too thin and then complain that it shows the brush marks. The whole trouble is, in fact, just due to its exceeding fineness. It is a trouble easily overcome by a little experience, and is in reality a very good quality in the pigment because investigation has proved beyond a shadow of doubt that the finer and more uniform a pigment is, the more satisfactory and durable is the paint prepared from it. So much, then, for our first alternative, basic sulphate of lead, a pigment which undoubtedly deserves your serious consideration.

We now have to consider what other pigments are available in this connection. A very brief examination of the large number of substances which in one way or another may be utilised as pigments suffices to show that only a very few can possibly stand any chance of competing with white lead. Very few have sufficient opacity to deserve consideration, and of those that are satisfactory in this respect the majority are out of court on account of their price. Oxide of tin, for example, has possibilities as a pigment, but the price of tin is always about ten times that of lead, and as you are business men I take it that I should only be wasting your time in talking about any pigment, however good it might be otherwise, that could not be put on the market at somewhere about 20*s.* per cwt. To put it shortly, in fact, the only other white pigments commercially available are those derived from zinc, which, in fact, have developed in recent years to the extent of being not merely a possible alternative, but an active rival to white lead at the present time. You are doubtless familiar with the fact that it is easy to make a working model of a snowstorm by melting some zinc in a pan and swinging it about in the air, when the zinc readily combines with the oxygen in the air to form a white powder known as zinc oxide, which is so light that it floats in the air in large flakes. By burning zinc in this way and collecting the white powder so formed by means of suitable plant, the substance is prepared on a commercial scale. It was first introduced as an artists' colour under the name of Chinese white, by which it is still known; it is also sometimes called zinc white, which rather opens the door to confusion because all zinc white is not necessarily oxide of zinc.

Of course, an enormous amount has been said in recent years on the subject of zinc white, and bitter has been the controversy between the rival partisans of zinc and lead. Looked at from an entirely impartial point of view, one cannot doubt that whilst it does not fulfil the extravagant claims made for it in some quarters, zinc oxide undoubtedly has very considerable merit as a pigment and is quite capable of replacing lead with advantage in many cases. It certainly leaves very little to be desired in respect of its chemical properties, which we found to be the weak point of white lead. Instead of being a weak semi-organic compound like white lead, this pigment is formed by the direct union of the metal and oxygen, and is an extremely stable compound, only decomposed with difficulty. It can only be absorbed by the human system with the greatest difficulty, and is therefore quite harmless; in respect of this quality it is superior even to the basic sulphate of lead just described, its toxic effect being at the most one-eighth that of white lead. Zinc oxide does not discolour under the influence of sulphur fumes, partly because the compound of zinc and sulphur is also white instead of being black, as in the case of lead, so that no change of colour is produced by any action that may take place. There is no doubt also that even if this did not fortunately happen to be the case, zinc oxide would not discolour to anything like the same extent as white lead, as, owing to its superior stability, it is only attacked by sulphur with difficulty. For the same reason zinc oxide, like sublimed lead, is much more resistant to decay than white lead, which is open to attack by almost any impurities in the air. In recent years zinc oxide, instead of being prepared from metallic zinc in the way I have outlined, has been largely made direct from the ore by calcining it in a somewhat similar manner to that employed in the production of the sublimed lead. Zinc made by this direct process, as it is called, is not quite so pure as that made from metallic zinc, generally containing a small quantity—2 to 5 per cent. —of lead, just as sublimed lead generally contains a little zinc.

A good deal of fuss has been made about this content of lead, and it has been urged that such an impurity might impart to the zinc all the defects of the white lead. But as I have pointed out at some length, the properties of white lead are largely due to its being a carbonate, and therefore easily decomposed. Now I am not quite sure as to the actual state in which this lead would exist in the zinc oxide, but it most certainly could not be a carbonate—most probably it exists in the form of a compound oxide of zinc and lead which would be a stable compound, which would not suffer from the defects of white lead, and would not influence the properties of the zinc to any appreciable extent in the small proportion in which it occurs.

As regards its qualities as a paint material, zinc oxide is, in the first place, undoubtedly superior in colour to either white lead or basic sulphate. In opacity or covering power, however, it is certainly inferior to white lead, and paints prepared with it do not dry nearly so well as those prepared with white lead; this latter has led to frequent criticism of zinc oxide, but it can readily be overcome by the addition of a suitable drier, such as manganese resinate. As regards the working qualities of zinc oxide with the brush, the same remarks apply as in the case of the basic sulphate of lead;

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in fact, the physical condition of the two is practically identical, as they are prepared in a closely similar manner. When carefully mixed in the manner already described, it forms a paint with remarkable spreading power, which produces a fine, smooth, lustrous coat, and there is no possible doubt that, once the slight knack of mixing it is acquired, results can be obtained with it in many classes of work which are far superior to those obtained under similar circumstances with white lead. As zinc is a more expensive metal than lead, the market price of zinc oxide is somewhat higher than that of white lead, and this militates against its use to some extent, although in comparing the prices one must take into consideration the relative lightness of zinc to lead, and the consequent fact that a given weight of zinc oxide is considerably more bulky than an equal weight of white lead. As in painting, it is a matter of the bulk of paint which will do a given amount of work, and not of weight, the difference in cost between the two is more apparent than real.

(To be continued.)

NEW CATALOGUES.

THE Wilson Engineering Company, Ltd., can point to the possession of thirty-five gold and other medals and awards, which gives an average of over one a year since their incorporation. While it is not suggested that success of that kind is the most indisputable proof of excellence, it is pleasant to know that laurels have been won at successive exhibitions at home and abroad by their manufactures. Many people, however, may put greater trust in the long list of important contracts carried out by this firm as culinary and heating engineers and ironfounders, or in the testimonials received. The "Wilson" patent portable cooking ranges are made in different sizes and patterns. It is claimed that they have larger ovens and boilers, and are of greater weight and durability than any hitherto manufactured. In all of them the flue passes completely round and under the oven so as to utilise practically all the heat. The company's short list for October also illustrates and prices their independent boilers, various warming stoves, the "Wilson" gas cooker, baths, and various aids to cooking.

HOWEVER much the hand laundry may be preferred, there can be no doubt that the makers of laundry machinery flourish amazingly. Messrs. W. Summerscales & Sons, Ltd., for instance, have as a frontispiece to their catalogue a photograph of the Phœnix Foundry at Keighley, which shows a range of buildings whose extent any manufacturer might envy. Of course this firm, with its sixty years' experience, does not ignore appliances worked by hand; but by far the greater number of the machines illustrated are driven by mechanical power. Moreover, part of the foundry is given up to the manufacture of cooking and heating apparatus, and to their general engineering branch. But the fact remains that machines are now made for doing all the minor operations of a laundry as well as all the major ones. There are ingenious machines like the "Torrance" shaper which folds, shapes and irons fold-collars at one operation, or the brushing machine which brushes the superfluous starch off after the starching process. These, however, play but a small part in the laundry as equipped by Messrs. Summerscales, especially if compared with a "Practical" all-metal washing machine, with a capacity of 200 shirts, a foul-linen washing machine, a hydro extractor, or a six-roller ironing machine. These are a few of the numerous larger appliances which are found now in up-to-date laundries. Messrs. W. Summerscales & Sons, Ltd., are real specialists in this branch of engineering, and are fully qualified to advise both as to the arrangements and planning of a new laundry, or the alteration of an old.

WE have received three catalogues from the General Electric Company; one deals with their electro-medical apparatus, another with electric bells and accessories, and the third is a twelve-page pamphlet showing some few of the multitudinous buildings where "Osram" lamps are employed.

THE Carron Company have issued two large showcards illustrating in colour respectively their eighteenth-century design firegrates, and the new "Carron" range, fitted with its inner oven door of glass, and a heat indicator. Both these, together with explanatory pamphlets, may be obtained on application.

VARIETIES.

MR. G. H. WILLOUGHBY, F.R.I.B.A., has removed to National Buildings, The Parsonage, Manchester, where he will continue his practice as an architect and surveyor.

THE Annan District Committee of Dumfries County Council last week agreed by nine votes to three to accept the tenders, amounting in all to 50,843*l.*, for the carrying out of the Lower Annandale water supply scheme.

THE Local Government Board have invited both the Association of Municipal Corporations and the Urban and Rural District Council Association to submit suggestions as to a desirable amendment of the present law relating to combined drains.

THE Middlesex County Council have decided unanimously in favour of promoting jointly with the Surrey Council a Bill for the widening of Kingston Bridge, so as to give a roadway of 35 feet across and two footpaths of 10 feet each. The Middlesex Council's moiety of the cost is estimated at 46,650*l.*

THE Building Committee of St. John's Church, Byfleet, Surrey, have decided to complete the whole of the scheme. It was originally intended to build the chancel, transepts, and one bay of the nave, but as the result of this decision the church will be completed by the addition of the other three bays of the nave and the narthex at the west end. Of the 10,000*l.* required, about 7,000*l.* has been raised.

LA Société Dieppoise des Habitations à Bon Marché, a society formed for the improvement of labourers' cottages, is doing excellent work, according to the last Consular report. It purchases land in elevated positions round Dieppe and lays out small villages of good cottages, containing four good rooms and two attics, with a garden of about 550 square yards. Two of these villages are completed and fully occupied, the third will contain thirty-eight cottages. Seven of these are already finished and occupied. All are taken as soon as finished, and in many cases purchased by their occupants. What was started as a purely philanthropic effort to improve the social life of the working classes has become a promising commercial speculation.

THE October issue of the A B C programme published by the Great Central Railway Company contains a vast amount of useful information for those who contemplate a journey to the Midlands and Northern Counties of England. On alternate Saturdays during October, November, and December cheap tickets, available by express trains, will be issued to over 200 inland towns and seaside resorts for periods up to eight days. On alternate Sundays such tickets will be issued to many important towns. To the pretty country around the Chiltern Hills and Vale of Aylesbury day and half-day trips are announced several days a week. For those interested in walking and cycling special inducements are offered. Other items of interest include lists of stations to which week-end and tourist tickets can be obtained. Copies of this comprehensive programme can be obtained, post free, from Publicity Department, 216 Marylebone Road, N.W.

THE London County Council Education Committee recommend that additional public elementary school accommodation be provided as indicated hereunder:—(1) About 850 places in Kensington. (2) About 600 places in Shepherd's Bush. (3) About 700 places in Harrow Road (Paddington). (4) About 700 places in Highgate New Town (St. Pancras). (5) About 1,000 places in Hampstead Road (St. Pancras). (6) About 350 places by the adaptation of the Tottenham Road P.T. centre (Hackney) for elementary school purposes. (7) About 250 places by the enlargement of the Berkshire Road School (Hackney). (8) About 900 places in Hackney. (9) About 375 places by the enlargement of the Daniel Street School (Bethnal Green). (10) About 1,500 places in Whitechapel. (11) About 1,000 places in Stepney. (12) About 800 places to replace the existing Fairfield Road School (Bow and Bromley). (13) About 400 places in Poplar. (14) About 128 places by the enlargement of the Gill Street School (Limehouse). (15) About 400 places in West Greenwich (Greenwich). (16) About 200 places in Grove Park (Lewisham). (17) About 800 places in Camberwell. (18) About 800 places on the Venetian Road site (Norwood). (19) About 300 places in the district of Angell Town and Newington, either by an enlargement of the Cormont Road School (Brixton) by about 300 places or by an enlargement of the Cormont Road School by about 150 places and an enlargement of the Faunce Street School (Newington) by about 150 places. (20) About 300 places by an enlargement of the Gipsy Road School (Norwood). (21) About 300 places in Battersea.

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THE

Architect and Contract Reporter.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

Special Position Spaces.—Unless ordered for weekly insertions the Proprietors cannot guarantee particular dates.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

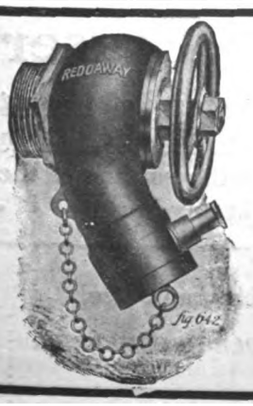
COMPETITIONS OPEN.

Bournemouth.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

Ireland.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

Ireland.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

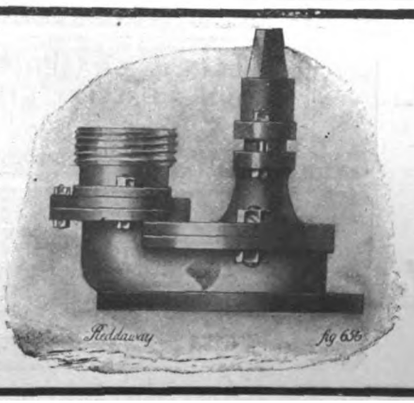
Ireland.—The Committee having charge of the building of the proposed Church House and Synod Hall at Armagh, to be erected adjoining the Cathedral, invite correspondence from competent architects with a view to the preparation of plans. Rev. C. K. Irwin, B.D., Hon. Sec., Brantry Glebe, Dungannon, Co. Tyrone.



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ISLE OF MAN.—Dec. 14.—The owners of the Villa Marina, Douglas, invite designs for pavilion and laying out pleasure gardens, &c., at a cost of 16,000*l.* One award of 200*l.* and two of 100*l.* will be made, the design becoming the absolute property of the landowners. Send 1*l.* 1*s.* deposit to Mr. Alexander Robertson, Town Clerk, Town Hall, Douglas.

MANCHESTER.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Class IV.—Town plan of Gidea Park—prizes of 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes V. or VI., November 30; Class IV., March 31, 1911. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, 33 Henrietta Street, Strand, W.C.

RUISLIP.—Nov. 30.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

WALES.—The Directors of the Oakdale Navigation Collies, Ltd., Tredegar, Mon., offer a prize of 100 guineas for the best set of plans for the building of a model village. Mr. A. S. Tallis, general manager, Oakdale Navigation Collieries, Ltd., Tredegar, Mon.

CONTRACTS OPEN.

ACCRINGTON.—Nov. 14.—For taking down existing buildings, excavating, preparation of site, and for the building of retaining and foundation walls in connection with the extension of Woodnook Mill, for Messrs. Higham's, Ltd. (contract No. 2). Mr. Henry Ross, A.R.I.B.A., 15 Cannon Street, Accrington.

AYLESBURY.—Nov. 16.—For erection of Portland stone dwarf walls, iron standards and chains, and laying paving, &c., around the statue of the late Lord Chesham in the Market Square, Aylesbury. Deposit 1*l.* 1*s.* Messrs. Percy A. Wright and W. H. Taylor, hon. secretaries, Town Hall, Aylesbury.

BARROW-IN-FURNESS.—Nov. 14.—For alterations at the municipal secondary school. The Borough Engineer and Surveyor's Office, Town Hall.

BARROW-IN-FURNESS.—Nov. 16.—For alterations to the wards on the women's side at the workhouse, Roose. Mr. H. T. Fowler, A.R.I.B.A., Cornwallis Street, Barrow.

BECKENHAM.—Nov. 14.—For the erection of a timber cricket pavilion at the Technical Institute playing fields. Deposit 1*l.* Mr. John A. Angell, surveyor, Beckenham.

BELFAST.—Nov. 16.—For the erection of conveniences in Botanic Gardens Park and Ormeau Park. The City Surveyor's office.

BISHOP AUCKLAND.—Nov. 17.—For erection of new post office, for the Commissioners of H.M. Works and Public Buildings. The Postmaster, Bishop Auckland. Send 1*l.* 1*s.* deposit to H.M. Office of Works, Storey's Gate, London, S.W.

BOURNEMOUTH.—Nov. 14.—For new stabling and loft at the East Yard, and other works in connection therewith. Deposit 1*l.* 1*s.* Mr. F. W. Lacey, borough engineer, Municipal Offices, Bournemouth.

BRISTOL.—Nov. 14.—For structural alterations in the old chapel at the Stapleton workhouse. Mr. J. J. Simpson, clerk, St. Peter's Hospital, Bristol.

BRADFORD.—Nov. 17.—For all or any of the following works:—Mason, joiner, plumber, iron, concrete, slater, painter, in proposed wool warehouse, Sunbridge Road, Bradford. Send names, with 10*s.* 6*d.* deposit per trade, to Mr. Rhodes Calvert, F.R.I.B.A., architect, Forster Square, Bradford.

BUDE.—Nov. 16.—For building a new restaurant and additions to the premises in Garden Terrace, Bude, Cornwall, for Mr. W. H. Barkell. Mr. Ernest Wise, M.S.A., architect.

BURNLEY.—Nov. 23.—For constructional ironwork in connection with the nurses' home and maternity ward at the Burnley Union workhouse. Messrs. Keighley, architects, Nicholas Street, Burnley, Lancs.

CASTLEFORD.—Nov. 18.—The West Riding Education Committee invite whole or separate tenders for the following works:—Castleford Wesley Street Council school alterations (builder, joiner, plumber). The Education Architect, County Hall, Wakefield. Send 1*l.* deposit in each case to the West Riding Treasurer, County Hall, Wakefield.

DONCASTER.—Nov. 21.—For erection of a sorting office. Deposit 1*l.* 1*s.* The Head Post Office, Doncaster, or H.M. Office of Works, Storey's Gate, London, S.W.

DURHAM.—Nov. 15.—The Durham County Council invite sole tenders for (1) Wheatley Hill (for about 442 infants), Mr. W. Rushworth, Shire Hall, Durham; (2) alterations and improvements at Thornley, Kibblesworth, and removal of iron school to Seaton Snook, Mr. N. Richley, Shire Hall, Durham.

EDINBURGH.—Nov. 17.—For sanitary annexes to married soldiers' quarters, Johnstone Terrace, Edinburgh Castle. Deposit 1*l.* 1*s.* H.M. Office of Works, 3 Parliament Square, Edinburgh.

FALMOUTH.—Nov. 26. For erection of a pavilion in Gyllyngdune Gardens, for the Borough Council. The Borough Surveyor's Office, Municipal Buildings.

FENCE HOUSES.—Nov. 14.—For building thirty-five houses at Fence Houses, Durham, five minutes' walk from the station, for the Lambton Collieries, Ltd. The Architect's Office, Philadelphia Lime depot.

FROME.—Nov. 14.—For erection of manual instruction rooms at Frome, Somerset. The Frome Milk Street Council School, or Mr. A. J. Picton, Bruton.

HATFIELD.—Nov. 14.—For works in the erection of four houses in the township of Hatfield, near Doncaster. Mr. Alexander M. Cobban, architect and surveyor, 12 Home Street, Scunthorpe, Lincs.

HULL.—Nov. 23.—For the steel roof work required in an extension of the tramway car shed on the Anlaby Road. The work consists of eleven trusses 48 feet 2 inches span, and 11 trusses 54 feet 6 inches span with steel columns, lattice girders and purlins. Deposit 1*l.* Mr. A. E. White, M.I.C.E. city engineer, Town Hall, Hull.

IRELAND.—Nov. 17.—For the repairs of the existing labourers' cottages in the several electoral divisions for the Ballymahon Rural District Council. Mr. P. MacGreevy, clerk.

ISLE OF MAN.—Nov. 22.—For the construction of a lighthouse tower, engine room, and dwelling houses on Maughold Head, near Ramsey, Isle of Man, for the Commissioners of Northern Lighthouses. Deposit 1*l.* 1*s.* Messrs. D. & C. Stevenson, civil engineers, 84 George Street, Edinburgh.

LEEDS.—Nov. 30.—For the erection of two hostels for men students at the City of Leeds Training College, Beckett's Park, Headingley. Deposit 2*l.* 2*s.* Send names at once to Mr. S. D. Kitson, architect, Vicar Lane, Leeds.

LONDON.—Nov. 15.—For the erection of a pavilion, &c., at the Isolation Hospital, Wales Farm Road, Acton, W. Mr. F. Sadler, engineer and surveyor, Council Offices, Winchester Street, Acton, W.

LOUGHBOROUGH.—Nov. 15.—For erection of St. Peter's Church. Deposit 2*l.* 2*s.* Mr. W. S. Weatherley, architect, 4 Suffolk Street, Pall Mall East, S.W., or Messrs. Barrowcliff & Allcock, architects, Town Hall Chambers, Loughborough, Leics.

MANCHESTER.—Nov. 26.—For the erection and completion of alterations and additions to the Bank Meadow Council schools, Ashton Old Road. Deposit 1*l.* 1*s.* The Education Offices, Deansgate, Manchester.

MERTON.—For the erection of a church at Merton, Surrey. Send names and list of works to Mr. J. Sydney Brocklesby, A.R.I.B.A., Bank Chambers, Kingston Road, Merton, Surrey.

PLYMOUTH.—Nov. 22.—For erection of barracks at Millbay, for the Territorial Force Association of the County of Devon. Deposit 5*l.* 5*s.* Mr. F. A. Clark, architect, 83 Old Town Street, Plymouth.

PORTSMOUTH.—Nov. 15.—For works to be done and materials to be supplied in constructing and maintaining for six months (1) a four-stall urinal, within Clarendon Gardens and entered from Clarence Road, Southsea; and (2) an eight-stall urinal, in Goldsmith Avenue, Fratton. The Borough Engineer's Office, Town Hall.

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SCOTLAND.—Dec. 5.—For erection of the superstructure of men's barrack block, foundations and superstructures of officers' and troop stables, and band block; also making new roads and parades at the new Cavalry Barracks at Redford, near Edinburgh, in the Scottish Command. Send 10*s.* deposit by Nov. 17 to the Director of Barrack Construction, 80 Pall Mall, London, S.W., or the Barrack Construction Office at Redford, on site of works.

SEAFORTH.—Nov. 21.—For alterations and additions required to convert Seafield House, Seaforth, near Liverpool, corner of Waterloo Road and Shore Road, into an asylum, for the Lancashire Asylums Board. Deposit 2*l.* 2*s.* Mr. James Gornall, clerk and steward, County Asylum, Rainhill, near Liverpool.

SHEFFIELD.—Nov. 22.—For the supply, delivery, and erection of roof principals, purlins, &c., for extensions to the engine room, boiler house, and coal store, comprising the Neepsend Generating station. Deposit 1*l.* 1*s.* Mr. S. E. Fedden, engineer, Corporation Electric Supply Department, Commercial Street, Sheffield.

SHEFFIELD.—Nov. 29.—For the supply, delivery, and erection of coal shoots for the Neepsend generating station. Deposit 1*l.* 1*s.* Mr. S. E. Fedden, general manager and engineer, Corporation Electric Supply Department, Commercial Street, Sheffield.

SOUTH BRENT.—Nov. 14. For erection of farm house and buildings at Downstow, South Brent. Mr. Matthews, Beara Farm, South Brent, Devon.

SOUTHEND.—Nov. 19. For erection of drill hall, instructor's quarters, stores, &c., at Prittlewell, and alterations and additions to the drill hall, York Road, Southend, Essex, for the Territorial Force Association of the County of Essex. Send 2*l.* 2*s.* deposit by Nov. 19, to Colonel F. F. Johnson, C.B., secretary, Bank Chambers, Chelmsford.

TODMORDEN.—Nov. 19.—For the various works required in the erection of the Castle Hill Council school. Send names before Nov. 19 to Messrs. Sutcliffe & Sutcliffe, F.S.I., architects, Todmorden.

WALES.—For erection of a surgery and doctor's and dentist's residence at Tredegar. Send 1*l.* 1*s.* deposit by Nov. 12 to Mr. A. F. Webb, architect and surveyor, 60 High Street, Blackwood.

WALES.—Nov. 12.—For erection of a cinematograph theatre in Oxford Street, Mountain Ash. Mr. George Kenshole, M.S.A., architect, Bargoed.

WALES.—Nov. 14.—For repairing and renovating Uchdir Congregational Church, New Tredegar. Mr. D. W. Price, Cloth Hall, New Tredegar, Mon.

WALES.—Nov. 14.—For erection of a hall upon a site at Church Village, Llantwit Fardre. Send 1*l.* 1*s.* deposit by Nov. 12 to the Vicarage.

WALES.—Nov. 15. For erection of infants' school, Darren View, and for the erection of boys' and girls' schools at Thomas Town Park (exclusive of special subjects block), all in Merthyr town. Send 2*l.* 2*s.* deposit by Nov. 15, to the Deputy Surveyor, Town Hall, Merthyr Tydfil.

WALES.—Nov. 16.—For erection of the Haverfordwest Territorial drill hall and officers' quarters. Deposit 1*l.* 1*s.* Mr. Hugh J. P. Thomas, architect, 9 Victoria Place, Haverfordwest.

WALES.—Nov. 17.—For rebuilding the Railway Hotel, Crumlin, Mon. Deposit 2*l.* 2*s.* Mr. H. J. Griggs, A.R.I.B.A., architect, Metropolitan Bank Chambers, Newport, Mon.

WALES.—Nov. 18.—For erection of bridges at (1) Cwmllinau, in the parish of Cemmes, and (2) Rhiwsaeson, in the parish of Llanbrynmair, for the Montgomery County Council. Deposit 1*l.* 1*s.* The Clerk of the Council, Bierriew Street, Welshpool, or the County Surveyor, Music Saloon, Broad Street, Newtown.

WALES.—Nov. 19.—For erection of a block of three shops, &c., at Blackwood, Mon. Mr. D. M. Davies, M.S.A., architect, Underhill Chambers, Caerphilly.

WALES.—Nov. 19.—For erection of thirty-three cottages at Cwmcelyn, Blaina, Mon., for the Blaina Central Building Club. Deposit 1*l.* 1*s.* Mr. A. F. Athron, chairman, Surgery Road, Blaina.

WALES.—Nov. 19.—For new shop Pontardawe, for the Alltwen and Pontardawe Co-operative Society, Ltd. Deposit 1*l.* 1*s.* Messrs. C. S. Thomas, Meager & Jones, architects, 15 Wind Street, Swansea.

WALES.—Nov. 19.—For erection of a schoolroom in Glancynon Terrace, Abercynon, for the Trustees of Tabernacle Welsh Calvinistic Methodist Church. Messrs. Morgan & Elford, Mountain Ash, or Mr. John Jones, ironmongery stores, Margaret Street, Abercynon.

WALES.—Nov. 21.—For erection of 100 workmen's houses, for the New Dynant Anthracite Colliery, Ltd., at Cwmmawr, Pontyberem. Mr. J. E. Burnell, 2 Frederick Street, Llanelly.

WALES.—Nov. 21.—For the construction of a post-mortem house and mortuary near the Dolau Subway, Llanelly. The Surveyor's Office, Town Hall, Llanelly.

WALES.—Nov. 29.—For erection of a minister's house at Mynachlogddu, Pembrokeshire. The Rev. L. G. Young, Bryncleddau, Clynderwen.

WALES.—Nov. 29.—For erection of thirty-six houses, together with the construction of roads, drains, &c., at Troedyrhiw, for the Park Building Club. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WESTERHOPE.—Nov. 19.—For taking down and removing an iron school building at Westerhope, and re-erecting same at Bedlington station. Deposit 1*l.* 1*s.* The Education Committee, Moothall, Newcastle-on-Tyne.

WOLVERHAMPTON.—Nov. 12.—For proposed extensions and alterations to the Royal Orphanage. Deposit 2*l.* 2*s.* Send names by Nov. 12 to Mr. Fred T. Beck, architect and diocesan surveyor, Wulfrun Chambers, Darlington Street, Wolverhampton.

WOODSETTS.—Nov. 16.—For the repairs and alterations (joiner and ventilator) to the Woodsetts school. Mr. S. Abson, divisional clerk, Education Offices, Woodhouse, Yorks.

WOOKEY HENTON.—Nov. 15.—For alterations and additions to the Wookey Henton Council school, Somerset. Messrs. Price & Jayne, Weston-super-Mare.

YORK.—Nov. 14.—For erection of a waiting shelter in Station Road. Mr. F. W. Spurr, city engineer, Guildhall, York.

TENDERS.

DORKING.

For the laying of 300 lineal yards of 7-inch stoneware pipes in connection with the Trashurst extension of the North and Mid-Holmwood sewerage scheme. Mr. W. RAPLEY, jun., surveyor.

Cummins & Sons	£280 0 0
Longhurst & Sons	227 0 0
Ossenton	190 0 0
Blaker	173 0 0
May & Son	170 0 0
Lown & Co.	143 0 0
ARTHUR, West Dorking (*accepted*)	134 0 0

HARTSHORNE.

For about three miles of cast-iron water mains, service reservoir, collecting tank, sluice valves, &c. Mr. NORMAN F. SPENCE, engineer, Ashby-de-la-Zouch.

Slater & Harrison	£2,840 17 9
British Construction Co.	2,354 5 7
Chamberlain	2,198 0 0
Clark	2,021 0 0
Moss & Sons	2,000 0 0
Brebner & Co.	1,977 0 7
Sanders & Torrance	1,970 0 0
Staveley Coal and Iron Co.	1,966 7 2
Barry	1,847 11 0
Winser	1,838 17 1
Jewell	1,830 0 0
Sykes	1,797 0 0
Barke & Sons	1,787 0 0
JOWETT, Prescot (*accepted*)	1,752 16 9

ISLE OF MAN.

For the construction of manholes, lampholes, tanks, supplying and laying about 9,000 yards of 9-inch and 12-inch sewers, also for laying 18-inch cast-iron outlet pipe, &c., at Laxey, Isle of Man. Mr. R. H. CROMPTON, A.M.I.C.E., engineer, Bowness-on-Windermere.

Taylor	£7,650 0 0
J. & T. Binns	7,306 0 0
Wellerman Bros.	6,542 0 0
Pearce	5,788 0 0
Exors. of Arundel	5,651 0 0
Graham & Son	5,588 0 0
Bentley & Co.	5,480 0 0
Brebner & Co.	5,385 0 0
DAWSON, Whitehaven (*accepted*)	5,193 0 0

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LAMBOURN.

For building a Council school to accommodate 100 children, for Berks Education Committee.

		Extra for tiled dado.
Chapman & Co.	£2,440 0 0	£39 14 0
Langman & Son	2,223 19 0	44 7 2
Chick	2,000 0 0	45 14 0
Paul	1,983 0 0	42 0 0
Simms & Son	1,960 0 0	42 0 0
Bosher & Sons	1,933 13 1	45 12 10
Smallbone & Son	1,933 10 0	42 10 0
Rowse & Co.	1,930 0 0	37 10 6
Elms	1,910 16 8	44 3 6
Honour & Son	1,881 8 5	40 0 0
Flewelling	1,807 5 0	50 0 0
Edwards & Sons	1,777 14 6	40 3 7
Colborne	1,729 6 1	43 4 0
Treasure Bros., Orpington (*recommended*)	1,678 0 0	43 0 0

LONDON.

For the erection of a new aviary at Clissold Park, for the London County Council.

Rowell & Co.	£225 0 0
Harding & Son	159 0 0
Palmer & Co., 5 Victoria Street (*recommended*)	116 0 0
Estimate of chief officer of parks department	150 0 0

For repairs and painting works to shore buildings, in connection with the training ship *Exmouth*, for the Metropolitan Asylums Board.

Aslett	£255 18 6
Hussey	235 0 0
Kazak	234 0 0
Vigor & Co.	194 0 0
Nightingale, Albert Embankment (*recommended*)	190 0 0
Engineer-in-chief's estimate	250 0 0

For supplying and fixing fanlight openers at the Brook Hospital, for the Metropolitan Asylums Board.

The "England" Works	£228 0 0
Vigor & Co.	215 0 0
Oram & Son	151 4 0
Lockerbie & Wilkinson (Birmingham), Tipton (*recommended*)	144 7 6
Engineer-in-chief's estimate	175 0 0

MERTHYR.

For erection of a maternity department at the workhouse.

Davies & Son	£3,340 0 0
Sullivan	2,935 10 0
James	2,858 0 0
Walters	2,587 0 0
Warlow & Warlow, Merthyr (*accepted*)	2,538 12 0
Williams & Son	2,022 10 11

PLAISTOW.

For the erection of electrical theatre, Barking Road. Mr. J. M. Gladwell, architect, Essex House, Stratford, E.

Webb	£3,278 0 0
Sheffield	2,898 0 0
Jerram	2,887 0 0
Maddison	2,831 0 0
Brown	2,700 0 0
Symes	2,597 0 0

SETTLE.

For excavating, levelling and draining playing-fields at Giggleswick School, Yorks. Mr. T. A. Foxcroft, surveyor, Settle.

Parker	£776 0 0
Parkin & Co.	712 3 8
Morley & Sons	697 2 4
Treasure	683 11 5
Downham	625 14 0
Smith	606 5 8
Whitaker	600 0 0
Wood	551 13 10
Woodburn	545 15 1
Pickthall & Son	542 10 0
Taylor & Son	528 6 4
Brassington Bros. & Corney	481 6 4
Schofield & Son	476 5 0
Tattersall & Earnshaw	389 14 4

SWINDON.

For additions and alterations to the G.W.R. drill-hall, for Wilts County Association. Messrs. Bishop & Fisher, architects, Swindon.

H. & C. Spackman	£1,384 17 0
Tydeman Bros.	1,348 5 11
Flewelling	1,326 17 0
Norman	1,320 10 0
Tarrant	1,246 19 9
Great Western Railway Co.	1,246 19 7
Williams	1,197 10 0
Leighfield	1,189 0 0
Colborne	1,149 0 0
Pope Bros., Swindon (*accepted*)	1,144 0 0

WILTON.

For erection of iron fire-escape staircases to the men's and women's dormitories of the workhouse. Mr. Harding, architect, Salisbury.

Wilton Bros.	£197 2 6
Randall	195 0 0
Neal & Watkins	188 10 0
Wort & Way	155 10 0
Dawkins	150 0 0
Hayward Bros.	149 10 0
Herring & Son, Chertsey (*provisionally accepted*)	135 0 0

THE TURIN EXHIBITION.

In view of the public interest aroused by the work of the Exhibitions Branch of the Board of Trade with regard to Brussels, Vienna, and Buenos Ayres, it may be interesting to give some account of the next great international undertaking for which the new organisation is making itself responsible. This is to be held in Turin, under the auspices of the Italian Government. Than the Valentino Park no finer site could have been found for such an enterprise, and it is satisfactory to know that the British section is to hold the most commanding position.

Turin, which has a population of 400,000 inhabitants, is, as regards age, contemporary with Rome, and is full of historic and antiquarian interest. It bore the name of Taurasia prior to its conquest by the Romans, and Taurasia from that time onwards became Tourini. Through many changes and vicissitudes it passed from its three days' resistance to Hannibal, after his passage over the Alps in 218, to its recognition as the capital of the kingdom of Italy in 1861, the town retaining its position of *urbs prima* until the seat of Government in 1870 was again transferred to "the City on Seven Hills." It possesses the finest armoury in the world, and, in addition, has the advantage of numerous beautiful museums, art galleries, and monuments, principally in bronze.

The Exhibition stands at the end of the Corso Vittorio Emanuele II. The Exhibition grounds extend along both banks of the river Po, and are in the Valentino Park, quite close to Porta Nuova, the central railway station. About 500 feet from the left bank of the river and 35 feet above it, in a splendid position at the south-east end of the Park, is the main façade of the buildings for the British section, which alone with part of the Italian section stands on the side nearest the city. The front of the buildings takes the form of a crescent, and is surmounted by a central dome with smaller domes supporting on either hand. The British Pavilion has been isolated and rendered practically fireproof. Every precaution has, in fact, been taken both by the Exhibitions Branch of the Board of Trade and by the Italian authorities to prevent such another disaster as occurred in Brussels. The space available for occupation by the representatives of British industry within the section is 20,000 square metres, and signs are not wanting to show that, however successful were the efforts of the Exhibitions Branch in Brussels, Buenos Ayres, and Vienna, the Turin Exhibition is likely to create a record.

The report of the Board of Arbitration which inquired into the Swansea painting trade dispute has been received. The men are awarded ½*d.* an hour increase, which brings the rate up to 8½*d.* Their hours are shortened to conform to the hours that rule in the local building trade, being six months short hours and six months long. It is provided that the men are not to smoke while at work, and that any further disputes are to be settled by arbitration.

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PROGRESS IN ENGINEERING.

At a meeting of the Institution of Civil Engineers on November 1 Mr. Alexander Siemens delivered his presidential address. In the course of it he briefly traced the history of knowledge from the prosperous period of Greece down to the present time, and drew the conclusion that in literature and art, or in philosophy, we cannot boast of being greatly superior to the ancients, but as far as engineering problems are concerned we have enormously advanced, thanks to the practical application of scientific theories.

He claimed that our progress is due principally: (1) To the improvement of the means of communication; (2) to the saving of manual labour by the introduction of mechanical power; which main features have caused a general lowering of the cost of "obtainables."

Both these features, characterising modern civilisation, are the outcome of the work of the engineering profession, and engineers may claim in addition that progress has by no means ceased in our time.

When we seek to recognise true progress in the material conditions under which we are living, it is not unreasonable to expect that any further advance will be made on the same lines as differentiate our present civilisation from that of the ancients, and that "lowering the cost of obtainables" based upon improvement of communications and upon the saving of manual labour will furnish a reliable test whether a change suggested to be made in our material surroundings is worth adopting or is merely an alternative without any prospect of being generally accepted.

Everybody readily agrees that improving the means of communication is a desirable form of progress, and that any innovation which has this result has come to stay, but, curiously enough, the consequences are not yet fully appreciated, and the saving in manual labour is still looked upon askance by those most concerned.

For the cry of the workman has been ever since machinery was introduced, that displacing manual labour by mechanical power means diminished opportunity of employment for him, and even nowadays, when the fallacy of this argument has been exposed, the leaders of the workmen strenuously oppose improvements in this direction.

Coupled with this anomalous attitude regarding machinery is another fallacy which appears to be equally difficult to eradicate, indicated by "restriction of output." This sentiment has its origin in the desire to remedy unemployment, and its promoters argue that to maintain our present mode of living a certain amount of work has to be performed daily; if, therefore, each man does as little work as possible for "living wages," more people must be employed and the workers have enough to maintain themselves comfortably. On the face of it this argument sounds plausible, but the weak point lies in the assumption that the work really necessary to be carried out daily is sufficient to give employment all round, and the supposed remedy fails because it increases the cost of production. Enhanced cost means diminished demand, and consequently decrease of sale; but if the sale falls off producers have to be dismissed. The consequence of restriction of output is, therefore, restriction of employment, the very opposite effect of what is intended by its advocates.

Accepting, therefore, that "lowering of cost" is the most important factor of modern progress, it is as well to emphasise that lower first cost by itself does not prove a "lowering of cost." The "cost of maintenance" should always be taken into account, in addition to the first cost, when comparing the value of several alternatives presented for the solution of a problem.

Bearing in mind that the distinguishing features of modern civilisation, viz., the saving of time, of exertion, and therefore of money, are the outcome of engineering science, it will be conceded that "lowering of cost" should be the guiding principle of all engineering design; and that, therefore, successful engineering must be based not only on technical knowledge, but on the proper understanding of economic laws.

The extent of the influence of commercial considerations has steadily increased since the middle of last century, owing principally to the great improvement in the means of communication, which, as far as technical knowledge is concerned, places engineers of all countries on an equal footing, and permits of unlimited competition between manufacturers wherever their works may be situated.

It is true that the technical conditions under which an engineer has to construct a road, a canal, dams and filter-beds for waterworks, drainage works, a dock, or the permanent way of railways, have not very much altered during the last sixty years, but directly it becomes necessary to utilise machinery or other manufactured products in engineering works, the economical aspect of the manufacturing process becomes paramount, and every effort should be made by the designing engineer to facilitate economy of manufacture.

The importance of this consideration arises partly from international competition, and partly from the tendency to supersede small workshops by large industrial establishments, because the machinery which is necessary for cheap production involves a capital outlay which can only prove remunerative by manufacturing on a large scale.

A broad distinction should, therefore, be made between contractors' work and manufactured produce.

With regard to contractors' work, the consulting engineer must be the real expert with a varied practical experience of similar work, in possession of all the necessary preliminary data for designing the complete works, and well acquainted with all the details of the method of carrying them out.

The contractor brings his implements to the spot where he carries out the work in accordance with the orders of the engineer, while it is practically of no consequence whether the contractor could design the works in question himself or not as long as he thoroughly understands the means and methods by which he should carry out the wishes of the engineer. In many cases the engineer employs a number of contractors for the various portions of the scheme, but the individual contractor need not have any knowledge of the work of the other contractors, nor need he even be informed as to the object in view. The contractor has therefore no responsibility for the design of the works or of any part of them, but the engineer who has worked out the problem and has superintended the carrying out in all its details takes the full responsibility of every part of the work being suitable for its purpose.

This is different with manufactured produce which is utilised in engineering works, the variety of which is constantly increasing, so that it is perfectly hopeless to expect that every engineer who requires manufactured goods to carry out his designs can be acquainted with every detail of their manufacture. Moreover, trained technical experts are nowadays entrusted with the task of directing industrial operations in factories, and it is inevitable that they should know more about manufacturing methods and requirements than outsiders.

Complaints have been made lately that some engineers have taken advantage of this circumstance by specifying results only, and inviting manufacturers to submit detailed descriptions of the means proposed by them for obtaining the specified results. This procedure implies that six or seven complete specifications have to be worked out by the manufacturers invited to tender, instead of only one by the engineer, and, it is complained, this enables a person who is not competent to draw up a satisfactory specification by himself, to act as superintendent of works to the exclusion of really competent engineers. In fact, it is alleged that sometimes the first proposals are not accepted, but their details are utilised by the engineer for drawing up a complete specification of his own.

The objection to this way of specifying engineering works, apart from its moral iniquity, is the waste of time it involves, and it is no excuse to say that the client will in the end obtain better work than, *ex hypothesi*, his engineer could have devised by himself.

When studying the means to stop such action it will be conceded, on reflection, that not even an Act of Parliament can prevent a man from undertaking work for which others do not consider him competent if, in the end, he satisfy his employers in a way that nobody can find fault with. In addition, we must remember that this problem refers only to manufactured goods that are required for the execution of engineering designs, which the manufacturer is called upon to deliver as finished articles, fit to pass tests agreed upon at the time the order was placed, and subsequent failure may have to be made good by the manufacturer, who therefore incurs a greater responsibility than a contractor does. Another point is that the same apparatus is often used in a variety of engineering schemes, while in the interest of economic manufacture it is desirable that its construction should be the same in all cases.

The question is, Who is to determine the construction or specify the tests under such circumstances: the engineer, who wants the apparatus for one particular purpose, or the manufacturer, whose inclination is to consider nothing but cheapness of construction?

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The Institution of Civil Engineers has furnished a satisfactory solution of the problem by establishing, in conjunction with other kindred institutions, the Engineering Standards Committee. By referring to the publications of this committee the consulting engineer can rely upon obtaining apparatus that will pass the tests therein specified, and the manufacturer can adapt his processes to the requirements set out by the committee without the risk of being invited to quote to specifications which may upset his methods of manufacture without benefit to anybody.

There are, however, two features of its activity which the committee will have to keep steadily in view: the one is the ever-increasing variety of manufactured produce requiring standard specifications, and the other the need of constant revision, so as to avoid hampering progress. This task is made more difficult by the international character of the competition in manufactured articles, which accentuates the necessity not only of doing all that is possible to increase economy of production, but also to facilitate in every way the introduction of new industries. A beneficial consequence of successful efforts in these two directions is the multiplication of opportunities for employment.

If the improvement in communications has the tendency of aggravating the burden of competition and of placing all nations on a footing of equality, it ensures, on the other hand, the continued progress of our civilisation by guarding it from the fate that the culture of so many ancient empires has experienced, which have left only scanty traces of their once flourishing state, because no adequate means existed for spreading their knowledge or for protecting it from destruction.

There is the further advantage that, in conjunction with the saving of manual labour, modern facilities of communication ensure leisure, and thereby opportunity for cultivating the mind in other respects than merely on utilitarian lines.

Engineers may claim, therefore, that their endeavours have materially furthered the great modern object of conferring the greatest good on the greatest number, but in continuing their efforts they must never forget that in these strenuous times more than ever the admonition of the Preacher obtains: "Whatsoever thy hand findeth to do, do it with thy might."

PUBLIC SLAUGHTER-HOUSES.

At a meeting of the Society of Engineers (Incorporated) at Caxton Hall, on Monday, Nov. 7, a paper on "Public Slaughter-houses" was read by Mr. S. M. Dodington (member).

The paper, which is the outcome of many years' patient study and extensive travel on the part of the author, began with a reference to the vital necessity of public slaughter-houses from the standpoints of public health, practical economy and humanity, and, after a brief historical survey, alluded to the conditions of slaughtering and meat inspection now in vogue in this country as a national disgrace, and as unworthy of the name of "system." The private slaughter-house, with its attendant evils, was strongly condemned, and the backwardness of our municipalities in making provision for public abattoirs was contrasted with the elaborate and careful attention given to the matter in other parts of the civilised world.

An outline was given of the principal points to be observed in order to ensure humane methods of slaughtering under efficient supervision and with a proper system of meat inspection; some of the principal types of public slaughter-houses were discussed, and the arrangement of typical Continental abattoirs described in detail. A pleasing exception to the usual inadequate British way of dealing with this matter is to be found, according to Mr. Dodington, in the slaughter-houses controlled by the Admiralty, which were erected or remodelled, after extensive enquiries, by a commission, and are regulated by well considered and efficient rules.

Stress was placed upon the qualifications which must be possessed by the veterinary surgeons in charge of the public slaughter-houses in Germany, in contrast to the inefficient way in which meat inspection is usually performed in England, by men whose qualifications for such important work are often quite inadequate. In general, the public abattoirs of Germany may be said to be a pattern for the world to follow, the care bestowed on their design being well repaid by the many advantages arising from the centralisation and efficient supervision of the slaughtering. Switzerland, Holland, Denmark and Scandinavia are closely following Germany's lead.

There is, said the author, plenty of scope for the engineer, not only in designing the structural work of abattoirs and cattle markets, but in improving the instruments used for stunning animals and the plant for handling their carcases, not to mention the work in connection with cold storage, water softening, sterilisation, electric lighting, drainage, &c., all of which form essential parts of the modern slaughter-house. Unfortunately, one has to travel abroad in order to see these matters properly dealt with, and the paper strove to put forward some ideas on public slaughter-houses by which this country would greatly benefit if public opinion could be sufficiently aroused.

Mr. R. S. Ayling expressed regret that the London County Council had not taken this matter up from the public health point of view. In some continental towns the public abattoir was the finest building in the town. He did not think that it need be that, but rather it should be a building which expressed its purpose, and one thoroughly well equipped.

Mr. E. F. Silcock gave his experience of surveying private slaughter-houses when he was in the city engineer's office at Leeds years ago, and remarked that it was a ghastly job.

VARIETIES.

The Royal Institute of British Architects will hold an extra general meeting (ordinary) on November 28, at 8 P.M., when a special paper by the Cavaliere Cesare Formilli will be read entitled "The Monumental Work of the Cosmati at Westminster Abbey," with lantern illustrations.

We are pleased to notice that for the third year in succession Mr. Archibald D. Dawnay, the head of the well-known firm of constructional engineers, has been elected Mayor of Wandsworth.

The Devon Education Authority have approved the following estimates for new schools:—Ashburton (175 scholars), 2,100*l.*; Brixham (150 scholars), 1,800*l.*; Foggintor (100 scholars), 1,200*l.*; Foggintor, master's house, 400*l.*; alterations Teignmouth, Brook Street Council school, 100*l.*; Colyton Council school, purchase of land and cottage, 400*l.*

According to an official return by the Metropolitan Water Board, the average daily supply of water in the board's area in September was 232,063,000 gallons, which was supplied to 1,094,226 houses, with an estimated population of 7,080,345. There was a reserve of water at the end of the month of 7,497,000,000 gallons.

The Canterbury Board of Guardians last week decided to make application to the Local Government Board for a loan of 3,000*l.* to cover the following schemes:—Drainage at the workhouse, 600*l.*; extension of laundry and store-rooms, 800*l.*; installation of the electric light, 170*l.*; fire appliances, including pumps, &c., 350*l.*; extension of "Woodville," 800*l.*; architect's fees, printing, &c., 280*l.*

Less than an hour's journey from London the most charming country is to be met with in Buckinghamshire. Attractive alike to those who cycle or walk or prefer more leisured means of getting about, to the antiquarian, the artist in search of the picturesque, or the angler intent on enjoying a day's quiet sport at some favoured spot, it is remarkable that this favoured holiday land has not become more widely known. The Great Central Railway Company have done much to open it up, and their tasteful and excellently illustrated handbooks for walkers and cyclists, entitled "Strolls in Beechy Bucks" and "Cycling Spins in Beechy Bucks," place the visitor in the way of finding for himself the roads and paths and the many places of interest with which the district abounds. Copies of each booklet will be sent post free for 3*d.* by Publicity Department, 216 Marylebone Road, London, N.W.

The Austin Motor Company, *Ltd.* (manufacturers of the "Austin" cars), Northfield, near Birmingham, have opened a depot at Nos. 18 and 22 Prince of Wales's Road, Norwich. Extensive structural alterations have been carried out. The front portion has been devoted to showroom purposes, with showcases, &c. The shop front is of polished mahogany with fluted pilasters and carved Ionic caps, and large plate-glass doors. In the rear is a machine shop with motor pit of sufficient length to take several cars, and the machinery includes a complete plant of electrically driven machines. The alteration of the premises has been executed by Messrs. J. Youngs & Son, builders, Norwich, under the supervision of Mr. F. W. Skipper, architect and surveyor, Norwich.

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FIREPROOF WOOD.

It has, we believe, been universally admitted for some years past that, of all fire-resisting materials, good, sound and solid timber, though doomed in the end, will withstand the effects of fire longer than iron and steel. The natural fire-resisting qualities of wood are now reinforced by science, until it would appear as if at last wood can be rendered not merely fire-resisting, but practically fireproof and non-inflammable. And this has been proved, not by laboratory experiments or in testing sheds, which must of necessity be somewhat inconclusive, but in actual practice, where failure would have been followed by disaster. For instance, two years ago an accident occurred on a train at the Sloane Square station on the District Railway line, which might have had shocking consequences, for, as the result of a short circuit below the floor level, the metal pipe carrying the electric-lighting wires and a metal junction-box were fused. The under side of the timber flooring, immediately above this pipe and junction-box, was charred in places under the intense heat. This charring, however, according to the Board of Trade report, "nowhere exceeded a quarter of an inch in depth, and no mark of fire could be found inside the car on the flooring, seats, or sides." The report says that the wood had been previously rendered non-inflammable, and this was done by the process of the Timber Fireproofing Company; in fact, "the real combustibles in this fire, if we use the word, were copper, iron, and brass." The behaviour of this wood proved so successful on this and other occasions that the Board of Trade now urges the use of non-inflammable wood in the construction of carriages used in tube railways.

There is, however, a wider sphere for non-inflammable wood than in the making of railway carriages. For a considerable amount of woodwork is still introduced into our buildings, even though they be designated "fireproof." And that woodwork constitutes a source of danger, or at least it usually does so. Now the Timber Fireproofing Company have an invention to offer which has successfully withstood for seven minutes the fierce heat of a short circuit. The process of rendering wood immune from catching fire or spreading flame consists briefly in submitting the wood to a vacuum treatment, whereby the air and moisture in the pores are removed and the sap vaporised, and then forcing by means of hydraulic pressure a solution of antipyrine chemicals throughout the pores and fibres of the wood and subsequently drying it in a dry-kiln.

Among the public bodies who have used wood so treated are H.M. Office of Works, for a power house at Blackfriars; Westminster City Council, for muniment room; Preston Corporation, for new power house; and London County Council, for sundry constructions and Aldwych subway tramcars. The woodwork in the additional buildings for Messrs. W. & T. Avery, Ltd., and Messrs. Cadbury Bros. and many other well-known firms has been so treated.

The cost of treatment naturally depends to some extent upon the kind and thickness of the timber. It is possible, therefore, only to quote to specification; but it may be taken on the average that the cost of fireproofing timber is 3*s.* per cubic foot at the company's works at Fulham. The cost of fireproofed timber should be compared with the price of other fireproof materials, such as steel, concrete, asbestos, &c., when it will be found to compare most favourably.

FOREIGN AND COLONIAL WORK FOR BRITISH CAPITAL.

The current *Board of Trade Journal* contains a number of announcements as to building work abroad:—

Brazil.—The *Diario* of October 19 contains a notice, issued by the Ministry of War, inviting tenders for the construction of barracks intended for the 3rd Regiment of Artillery in Cruz Alta. A deposit of 10.000 milreis (about 700*l.*) will be required to qualify tenders, which will be opened on Dec. 9. Tenders should be addressed to the "Capitao Ajudante, Escriptorio da Commissao Constructora de Quarteis no Rio Grande do Sul," Santa Maria, Rio Grande do Sul, Brazil. Further particulars respecting the contract may be obtained at the same address. Local representation is practically necessary.

Argentina.—The *Boletin Oficial* of October 12 contains a decree authorising the contract for the construction of the building intended for the National Department for Hygiene and Sanitation at Buenos Aires to be placed with Messrs. Vinent, Maupas & Jauregui. The cost of the work is estimated at about 87,000*l.*

Toronto.—The Bank of Toronto have awarded a contract for the construction of a new head office at that city at a cost of 1,000,000 dollars (about 205,000*l.*). Among the requirements for the work will be steelwork, ornamental ironwork, marble, bronze work, vaults and safes, plunger elevators, cabinet work, stained glass and decoration. Mr. Field states that favourable consideration would probably be given to offers from British firms who have accredited representatives at Toronto, or who would be willing to send a representative out there.

Straits Settlements.—The *Straits Budget* of September 29 publishes the annual address by the Governor of the Straits Settlements on the financial, &c., position of the colony, in the course of which he stated that among the more important services which it is proposed to undertake in 1911 are the following:—Building of a new district court; construction of a sea wall across the gap at Johnston's Pier; raising of low-lying land adjoining Penang Road, and draining of the swamp at Balestier Road; erection of a lighthouse on Kuruman Island, off Labuan; construction of a hill railway; completion of water supply extension works at Bukit Seraya, Province Wellesley, and Lumut, Dindings; construction of revetment wall to part of the reclamation at the Malacca river mouth. Reference was also made by the Governor to the following municipal works:—The sanitary engineer appointed to report on the removal and disposal of sewage at Singapore has recommended the establishment of a system of underground sewers throughout the town. A scheme has also been under consideration for increasing the water supply of Penang by the construction of a large storage reservoir at the Waterfall Gardens. A new hospital for infectious diseases is shortly to be built in Singapore.

Note.—The names and addresses of persons with whom firms might communicate in connection with each of the foregoing matters may be obtained by British firms on application to the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

TRADE NOTES.

W. & T. Avery, Ltd., of London and Birmingham, have been awarded at the Buenos Aires Railways and Land Transport Exhibition the Grand Prix for their exhibition of weighbridges and weighing apparatus, which included a complete machine for weighing trains in motion.

The Brightside Foundry and Engineering Company, Ltd., of Sheffield, London and Birmingham, have secured from the War Office the contract for the new steam generating plant and complete centralised heating installation at the balloon factories, offices and dirigible shed at South Farnborough, Hants.

Mr. Alex. G. Lee, late managing director of Hofler, Ltd., has commenced business in his own name at 14 John Street, Bedford Row, W.C. He has acquired the plant and stock of Austrian oak panelling and joinery work for which his late firm held a high reputation, together with the goodwill. Numerous examples of this work are displayed in his new showrooms at the above address. In addition, Mr. Lee has taken over the sheet-lead damp course, which has been supplied to H.M. War Office, Admiralty, &c. Mr. W. Anderson will be his outdoor representative. Many of our readers, to whom Mr. Lee is well known, will join in our wishes for his success.

Amongst the recent contracts entered into by the Horsfall Destructor Company are a large installation for the Mersey Docks and Harbour Board and for the Aberdare U.D.C., both of which are now approaching completion. Their other contracts for patent refuse-destructor plants include Newtown (Montgomery), Grimsby, Colombo, and Manaos, in Brazil, all of which are of considerable importance and value. This company was recently awarded at the Health Exhibition at Brighton, held under the auspices of the Royal Sanitary Institute, a silver medal for the patent mechanical charging gear (overhead tub system), similar to that in successful operation at the Poplar destructor; and a bronze medal for their balance tip, self-acting sanitary carts under the Constable patents, which this company now act as sole licensees for. Models of both the subjects of these awards are to be seen at the Parkes Museum of the Royal Sanitary Institute, London. The company is now under the active supervision of Mr. Thomas W. How as managing director in conjunction with Mr. George Watson.

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ALTERNATIVES TO THE USE OF WHITE LEAD.*

(Concluded from last week.)

THERE is another white pigment derived from zinc which deserves consideration. This pigment, generally known as lithopone, is made by taking advantage of the fact that the sulphide of zinc, as well as the oxide of zinc, is white. Although pure zinc sulphide is sometimes met with as a pigment, it is too costly for commercial use, and possesses other disadvantages which are to a great extent obviated by reduction with barium sulphate. A mere mixture of barytes with the zinc sulphide would be useless on account of the resulting lack of opacity, but by preparing the two substances in a state of chemical combination it is possible to obtain a product vastly superior in this respect; it is, in fact, generally admitted that lithopone, properly prepared in this manner, is superior in opacity to any other commercial white pigment. From this point of view it is an improvement on zinc oxide, the opacity of which is a weak point. In the chemical properties that concern us it is closely similar to zinc oxide, and as such is quite satisfactory. As compared with zinc oxide and basic sulphate white, lithopone is coarse in texture, and in this respect it resembles white lead, to which it approximates more in working qualities, although it does not possess that peculiar soapy texture which is so cherished by painters. Owing to the fact that lithopone only contains less than a third of its weight of zinc, it can be produced at a very low price, very much lower, in fact, than any of the other pigments we have considered, including white lead. Unfortunately, although so far eminently satisfactory as a pigment, it has qualities which render it an unsatisfactory material for many kinds of work. The most objectionable point about this pigment is that it is liable to go seriously off colour on exposure to sunlight, a property which has never been satisfactorily explained.

We have, then, three pigments comparable with white lead which are actually available on the market at the present time, and the question now arises as to whether one is justified in suggesting that the use of white lead should be abolished under all circumstances, in favour of one or other of these alternatives. There is undoubtedly at the present time a strong feeling in some quarters that the employment of white lead in the paint industry should be definitely prohibited. As you are aware, this step has actually been taken in France, and the prohibition is shortly to come into force. One will watch with interest the result of the operation of this law, and see how far it serves the purpose for which it is intended. Personally, I think it is a mistake to introduce legislation into a question which, although apparently simple, is really far more complicated than it appears. If white lead is dangerous and it is capable of being efficiently replaced under every circumstance by other materials, the enlightened painter does not need force to persuade him to abandon it. The fact that the use of white lead entails additional risk and additional outlay under the Workmen's Compensation Act seems to me a far more potent factor than any direct legislation. Surely, as practical business men, you are not going to pay heavily for the privilege of using *any* material if you find that circumstances enable you to do without it?

I am not prepared even to suggest that under every conceivable circumstance the entire abolition of white lead would be necessary or desirable. Paint manufacture has been the subject of much scientific investigation in recent years, and we have begun to realise that it is not quite so simple as it appears at first sight. You cannot lay down a hard and fast rule for the preparation of paint to suit every conceivable condition, but the composition of paint must be varied to secure the best results under varying conditions of use and exposure. Taking the four white pigments we have passed under review, each of them has distinct and definite properties; as I have shown you, each has certain virtues and certain defects. It would be idle to recommend that any one of these should be utilised exclusively for paint manufacture under all conditions and in all circumstances to the exclusion of the others. You will see that this statement may be taken both ways. Whilst suggesting that each pigment, including white lead, has its own particular sphere, it also suggests that under many circumstances, apart entirely from the question of its poisonous properties, which is more directly affecting you at the present moment, white lead is by no means the most suitable pigment to use.

As you are no doubt aware, the question of the relative value of different pigments for various classes of painting is at the present time being very carefully and exhaustively investigated in America. The progress of the systematic testing of paints under service conditions carried on at Atlantic City is, doubtless, being keenly followed by many of you. The results so far obtained are very much to the point in the matter under discussion, more especially as they provide definite unbiassed information as to actual results. On carefully examining the results that have been published we find that none of the pigments we have considered forms a perfectly satisfactory paint for exterior work; white lead alone is very unsatisfactory, the paint rapidly disintegrating in the manner familiar to you as "chalking." Basic sulphate exhibits the same tendency in an almost equal degree, whilst zinc oxide, though practically free from this defect, is liable to crack and scale. For this class of work also it seems clear that lithopone is practically useless. The general conclusion that is expressed in the reports, and which certainly seems clearly demonstrated by the results of the experiments as described, is that the best results are obtained by using two or more of these pigments in combination, together with a small amount of crystalline material, such as barytes. The most suitable combination of pigments to use varies with the condition of exposure—one that proves quite satisfactory on the sea-coast may be useless in the centre of a manufacturing town. Then, again, one has to consider the material to be painted, which influences considerably the composition of the paint. Thus, for the protection of metallic structures zinc oxide has been shown to possess properties of enabling iron to resist corrosion, which seem to point to its being the material most likely to prove satisfactory in this respect. But it would be useless for me to attempt to indicate to you definitely the most suitable pigment to use under every varying condition of your work, because, carefully and impartially as I might study the matter, I could only form conclusions based on my own limited experience, supplemented by such information as is available, most of which is biassed. You are practical men, and a practical man should not value anybody's opinion when he is in a position to obtain definite facts. I say this emphatically, because the whole question we are dealing with to-day is not a matter for discussion at all, but for systematic experiment and inquiry. If you are in earnest in wanting to get to the bottom of this matter, your best course is not to listen to anybody, but to put on foot a systematic series of practical tests. You may, perhaps, argue that as the whole matter is already in course of being thrashed out in America there is no need to do it again over here. But I would point out that, valuable as the Atlantic City results are, there is no certainty that they would apply equally over here, under totally different conditions of climate and environment. Moreover, at the best they can only be studied at second-hand.

I am glad to see that you have already recognised the importance of dealing with the matter in this manner to the extent of having carried out various exposure tests; but again I would like to urge that in order to place the matter on a firm basis and establish the facts beyond dispute, the investigation must be carried out on a very much more extensive scale, and under conditions which render it representative and authoritative. The importance of the question is sufficient to warrant you in seeking the co-operation of the recognised bodies connected with such trades and professions as are interested in painting from one point of view or another, in order to establish an absolutely impartial committee representing all interests, whose findings should be authoritative and beyond dispute. The arrangements for carrying out and reporting on the test should be organised on strictly scientific lines and controlled by a trained experimentalist in order to obtain accurate results. The tests should be conducted on such a scale and under such varying conditions as would eliminate any possibility of error from local conditions, and secure information relative to all circumstances the painter is likely to encounter in general work.

When the matter has been dealt with on these lines—and, to my thinking, not before—you will be able to answer with satisfaction and certainty the question: "Is white lead necessary to the painter, and how far may it be replaced by other pigments with advantage to his work?"

* A paper by Mr. Noel Heaton, B.Sc., delivered before the National Association of Master Decorators at the Convention at Newcastle.

THE will of Mr. George Humphreys, of Redland, Bristol, founder of the firm of George Humphreys & Son, builders and contractors, has been proved at 25,925*l*.

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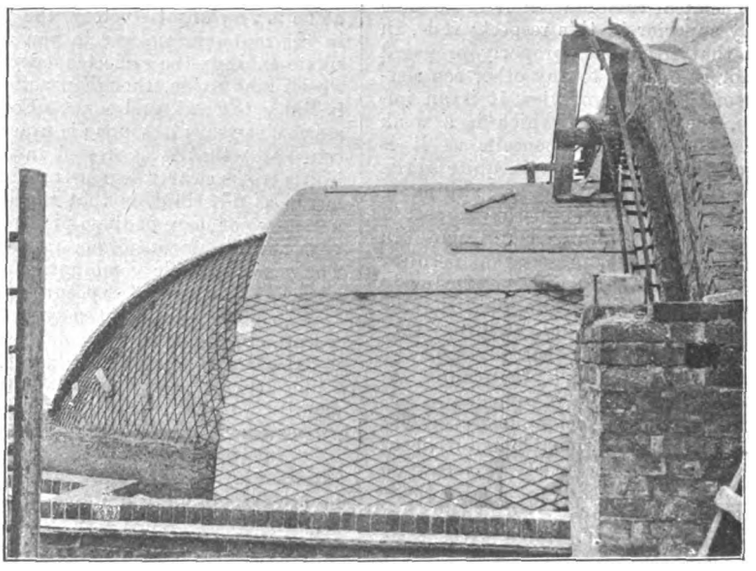
EXPANDED METAL FOR REINFORCED CONCRETE CONSTRUCTION.

FEW of our readers can be by now unfamiliar with one or other of the pamphlets issued by the Expanded Metal Co., Ltd., York Street, S.W. The first deals with "Expanded Metal Lathings for Plaster Work," the second with "Expanded Steel for Reinforced Concrete Construction," and there is a third which comprises both these sections. It is not surprising to find that this year has seen the production of a sixth edition of each of the two first, for they are both considerably more than trade catalogues in the usual sense of that term. The latest edition of the pamphlet dealing with the use of expanded metal in reinforced concrete, for instance, is more in the nature of a copiously illustrated handbook of over two hundred pages.

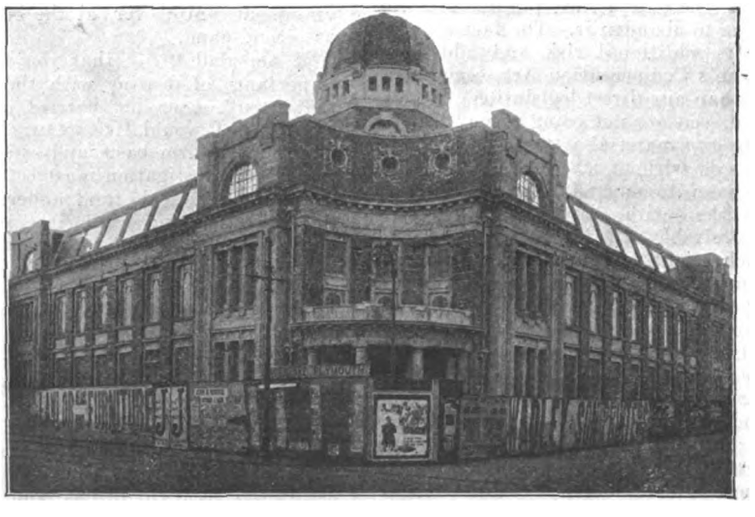
Expanded metal has been in use for over twenty years, and consequently there is no need here to give a lengthy description of it. It will suffice to say that it is machine made from sheets of best quality rolled steel, cut and expanded into meshes of various shapes. The usual types of expanded steel used in reinforced concrete construction are the 3-inch Diamond Mesh (which measures 3 inches by 8 inches from centre to centre of its intersections), and the Rib Mesh (where the ribs are constant in cross section but are spaced at varying centres) in its various meshes and weights. These have multitudinous adaptations; some of those illustrated are as reinforcement for concrete in foundations, roofing, walls, floors, arches, bridges, grain silos, reservoirs, tanks, pipes, conduits and retaining walls. Included in the book are tables of properties of the Diamond Mesh and Rib Mesh expanded steel; various tests by Messrs. David Kirkaldy & Son; fire tests of the Fire Prevention Committee, in which it came under the classification of "Full Protection" (Class B); and a considerable number of other tables. Photographs, diagrams, and brief descriptions of some of the contracts carried out impart a live interest to the pages, for by far the greater number show "how it is done," as well as when the work is completed.

Expanded metal is constantly being put to some new use. A fairly recent development of the company's business is in the production of expanded steel bars, *i.e.*, a bar from which a series of meshes is expanded, resulting in a sheet of expanded steel having a selvage edge in the form of a bar of steel rigidly attached to it along one side, the junctions between the sheet and the bar, or the web and the bulb, remaining uncut during the process of manufacture.

About twelve months ago Messrs. Kirkaldy & Son carried out some interesting tests which are described in the pamphlet. Six beams of 10-feet span were made, three being reinforced with a couple of plain bars, and three with a couple of expanded steel bars; the area of bars, quality of steel and size of beams being identical. The concrete was 4—2—1 mixture, the aggregate being Thames ballast. All the beams reinforced with plain bars failed suddenly by shear, or more correctly, diagonal tension at a load insufficient to develop the full tensional value of the reinforcement; whereas in the beams reinforced with expanded steel bars the gradual failure was a pure compression failure; in fact, the concrete and steel arrived at their crippling stress almost simultaneously. Shear and diagonal tension cracks were present, but they in no way influenced the failure. The load carried was considerably more in the expanded steel bar beams than in the plain bar beams.



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MR. CHAS. F. WARD, A.R.I.B.A., Borough Architect.

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AGENTS FOR AMERICA:

The International News Co., 5 Bream's Buildings, Chancery Lane, London, England, and New York.

AGENTS FOR CANADA:

Messrs. WM. DAWSON & SONS, Ltd., 91 Church Street, Toronto, to whom all correspondence for Subscription and Advertising Rates should be made.
Subscription $5.20.

AGENTS FOR AUSTRALIA, NEW ZEALAND AND TASMANIA:

Messrs. GORDON & GOTCH, Melbourne, Sydney, Brisbane, and Perth, Australia; Wellington, Christchurch, and Auckland, New Zealand; Launceston and Hobart, Tasmania.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

Special Position Spaces.—Unless ordered for weekly insertions the Proprietors cannot guarantee particular dates.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

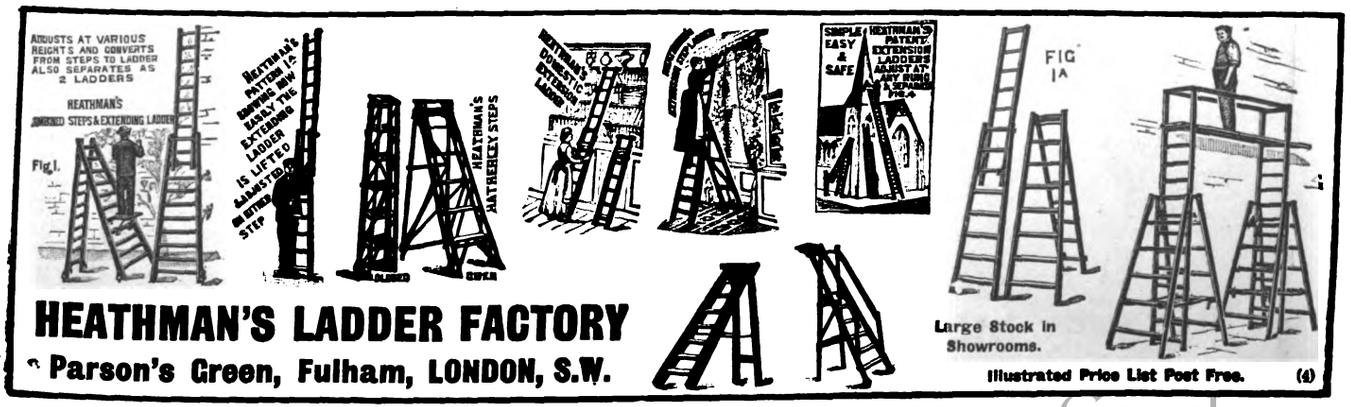
COMPETITIONS OPEN.

Bournemouth.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

Coventry.—March 1.—The Corporation contemplate the erection of municipal offices in the centre of the site, and also possibly a town hall, and accordingly invite competitive designs. Mr. E. Guy Dawber, F.R.I.B.A., will act as assessor. Deposit 2*l.* 2*s.*, which will be refunded on receipt of a bona-fide design or if the particulars are returned within fourteen days of receipt. Mr. Geo. Sutton, town clerk, 10 Hay Lane, Coventry. (For further particulars see advertisement, November 18.)

Ireland.—Nov. 29.—The Bangor Urban District Council invite plans, specifications, and estimates for erection of hot seawater baths at Pickie. Alternative schemes (plans, specifications and estimates) to be sent in—(*a*) For erection of heated swimming pond, slipper and other baths, &c.; (*b*) scheme (*a*) omitting swimming pond, but providing for construction of same as an addition if thought desirable at a proportionately reduced cost. The cost of scheme (*a*) inclusive of all professional fees, not to exceed 7,050*l.* The person whose scheme may be selected will be appointed architect at a fee of 5 per cent. on the accepted tender, this sum to cover all fees and expenses. When tenders are received, if the lowest exceeds the architect's estimate by 15 per cent. or over, no fees whatsoever will be paid to the architect. Further particulars can be had on application to Mr. J. Milliken, clerk, Town Hall, Bangor, Co. Down.

Ireland.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable



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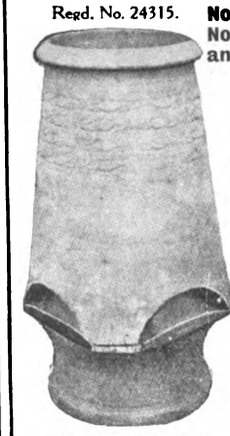
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consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

IRELAND.—The Committee having charge of the building of the proposed Church House and Synod Hall at Armagh, to be erected adjoining the Cathedral, invite correspondence from competent architects with a view to the preparation of plans. Rev. C. K. Irwin, B.D., Hon. Sec., Brantry Glebe, Dungannon, Co. Tyrone.

ISLE OF MAN.—Dec. 14.—The owners of the Villa Marina, Douglas, invite designs for pavilion and laying out pleasure gardens, &c., at a cost of 16,000*l.* One award of 200*l.* and two of 100*l.* will be made, the design becoming the absolute property of the landowners. Send 1*l.* 1*s.* deposit to Mr. Alexander Robertson, Town Clerk, Town Hall, Douglas.

MANCHESTER.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Class IV.—Town plan of Gidea Park—prizes of 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes V. or VI., November 30; Class IV., March 31, 1911. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, 33 Henrietta Street, Strand, W.C.

RUISLIP.—Nov. 30.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

SOUTHPORT.—The Corporation invite architects practising in Southport to submit designs for a new public elementary school at Churchtown. Premiums of 50*l.*, 25*l.*, and 15*l.* will be paid to the authors of the first, second, and third successful designs. Full particulars, &c., may be obtained from Mr. J. Ernest Jarratt, town clerk, Town Hall, Southport.

WALES.—The Directors of the Oakdale Navigation Collies, Ltd., Tredegar, Mon., offer a prize of 100 guineas for the best set of plans for the building of a model village. Mr. A S. Tallis, general manager, Oakdale Navigation Collieries, Ltd., Tredegar, Mon.

CONTRACTS OPEN.

BISHOP AUCKLAND.—Nov. 22.—For building boundary walls and the erection of an iron fence on land adjoining the workhouse. Mr. F. H. Livesay, architect, Bishop Auckland.

BOURNEMOUTH.—Nov. 19.—For rebuilding the Victoria Hotel. Forward names before Nov. 19 to Mr. H. E. Hawker, F.S.I., M.S.A., architect, St. Peter's Chambers, Bournemouth.

BRENT.—Nov. 25.—For the erection of a hall at South Brent, South Devon. Mr. H. Hansford Worth, 42 George Street, Plymouth.

BURNLEY.—Nov. 23.—For constructional ironwork in connection with the nurses' home and maternity ward at the Burnley Union workhouse. Messrs. Keighley, architects, Nicholas Street, Burnley, Lancs.

BUXTON.—Dec. 10.—For proposed alterations to Old Wye House, for the Derbyshire education committee. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

BUDE.—For the erection of a house on the Paize and Well Estate, Bude. Messrs. Hatchard-Smith & Son, F.R.I.B.A., architects, 76 Watling Street, London, E.C.

CARBIS BAY.—Nov. 24.—For alterations and additions to the Carbis Bay Hotel, Cornwall. Messrs. Cowell & Cowell, architects, Newquay.

CHADDERTON.—Nov. 26.—For works required at Eustace Street school, including the removal of galleries from the infants' central hall and the babies' room. Mr. J. Whitehead, clerk, the Education Offices, Chadderton, Lancs.

EDINBURGH.—Nov. 25.—For the erection of a temporary school building of wood and iron at Fountainbridge. (1) Mason and brickwork, (2) carpenter and joiner work, (3) plumber work. The School Board Offices, Castle Terrace, Edinburgh.

FALMOUTH.—Nov. 26.—For erection of a pavilion in Gyllyngdune Gardens, for the Borough Council. The Borough Surevyor's Office, Municipal Buildings.

FENCE HOUSES.—Nov. 21.—For building eighteen four-roomed houses at Fence Houses, Durham, five minutes' walk from the station, for the Lambton Collieries, Ltd. The Architect's Office, Philadelphia Lime Depot.

FOLESHILL.—Nov. 22.—For erection of a home for children in Lythall's Lane, Foleshill, near Coventry. Deposit 2*l.* 2*s.* Mr. A. E. Newey, architect, Union Offices, Foleshill.

FURNESS VALE (CHESHIRE).—Nov. 21.—For alterations and additions to County Council school at Furness Vale (Yeardsley-cum-Whaley). Deposit 1*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

GUILDFORD.—Nov. 21.—The Guildford Rural District Council invite tenders for (1) erection of a steam road roller shed and stores and fencing on the Pound Field estate, Stoke, and (2) purchase of old shed, &c., in Stoke Road. The Engineer of the Council, Commercial Road, Guildford.

HARRINGTON.—Nov. 29.—For building a stone wall to bound the site of the proposed cemetery at West Ghyll End, High Harrington, Cumberland. Mr. C. Eaglesfield, surveyor, Gordon Street, Workington.

HULL.—Nov. 23.—For the steel roof work required in an extension of the tramway car shed on the Anlaby Road. The work consists of eleven trusses 48 feet 2 inches span, and 11 trusses 54 feet 6 inches span with steel columns, lattice girders and purlins. Deposit 1*l.* Mr. A. E. White, M.I.C.E, city engineer, Town Hall, Hull.

HULL.—Nov. 23.—For the builders' work in connection with an extension of the tramway car shed on the Anlaby Road. Mr. A. E. White, M.I.C.E., city engineer, Town Hall, Hull.

ISLE OF MAN.—Nov. 22.—For the construction of a lighthouse tower, engine room, and dwelling houses on Maughold Head, near Ramsey, Isle of Man, for the Commissioners of Northern Lighthouses. Deposit 1*l.* 1*s.* Messrs. D. & C. Stevenson, civil engineers, 84 George Street, Edinburgh.

LEEDS.—Nov. 22.—For proposed alterations and rebuilding of premises for the Gas Department, in Meadow Lane. Deposit 3*l.* 3*s.* Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

LEEDS.—Nov. 30.—For the erection of two hostels for men students at the City of Leeds Training College, Beckett's Park, Headingley. Deposit 2*l.* 2*s.* Send names at once to Mr. S. D. Kitson, architect, Vicar Lane, Leeds.

LONDON.—Dec. 2.—The Commissioners of H.M. Office of Works and Public Buildings are prepared to receive tenders for the new public offices Westminster extension first contract—foundations, vaults, &c. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

LYMM.—Dec. 5.—For alterations and additions to Lymm Grammar School, Cheshire. Deposit 1*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

MANCHESTER.—Nov. 26.—For the erection and completion of alterations and additions to the Bank Meadow Council schools, Ashton Old Road. Deposit 1*l.* 1*s.* The Education Offices, Deansgate, Manchester.

MERTON.—For erection of a church at Merton, Surrey. Send names and list of works to Mr. J. Sydney Brocklesby, A.R.I.B.A., Bank Chambers, Merton, S.W.

NELSON.—Nov. 26.—For erection of a public urinal on land adjoining Manchester Road, near Hargreaves Street. The Borough Surveyor, Cross Street, Nelson, Lancs.

NOTTINGHAM.—For the erection of the new Nottingham and Midland Eye Infirmary, The Ropewalk. Deposit 1*l.* 1*s.* Written application to be made to Mr. Arthur Marshall, A.R.I.B.A., architect, King Street, Nottingham.

PLYMOUTH.—Nov. 22.—For erection of barracks at Millbay, for the Territorial Force Association of the County of Devon. Deposit 5*l.* 5*s.* Mr. F. A. Clark, architect. 83 Old Town Street, Plymouth.

SCOTLAND.—Nov. 28.—For the following works in connection with the extensions of the West Fife, &c., infectious diseases joint hospital, Dunfermline, viz.:—(1) Excavator, brick and mason works; (2) carpenter and joiner works; (3) slater work; (4) plumber work and gas fittings; (5) plaster and cement works; (6) heating, engineering and

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machinery works. Send 1*l.* 1*s.* deposit for each schedule to Mr. William G. D. Simpson, clerk, 24 New Row, Dunfermline. Mr. E. Simpson, architect, 16 King Street, Stirling, or Messrs. Douglas and Wright, I.M., 6 High Street, Dunfermline.

SCOTLAND.—Nov. 30.—For the mason, joiner, plasterer, plumber and painter work to be executed at Annan Manse. Mr. C. Watson, heritors' clerk, Annan.

SEAFORTH.—Nov. 21.—For alterations and additions required to convert Seafield House, Seaforth, near Liverpool, corner of Waterloo Road and Shore Road, into an asylum, for the Lancashire Asylums Board. Deposit 2*l.* 2*s.* Mr. James Gornall, clerk and steward, County Asylum, Rainhill, near Liverpool.

SHEFFIELD.—Nov. 22.—For the supply, delivery, and erection of roof principals, purlins, &c., for extensions to the engine room, boiler house, and coal store, comprising the Neepsend Generating station. Deposit 1*l.* 1*s.* Mr. S. E. Fedden, engineer, Corporation Electric Supply Department, Commercial Street, Sheffield.

SHEFFIELD.—Nov. 29.—For the supply, delivery, and erection of coal shoots for the Neepsend generating station. Deposit 1*l.* 1*s.* Mr. S. E. Fedden, general manager and engineer, Corporation Electric Supply Department, Commercial Street, Sheffield.

STOW-ON-THE-WOLD.—Nov. 24.—For work necessary to be done in connection with the extension of the cemetery, viz., (1) laying out the ground adjoining the present cemetery as an additional burial ground; (2) erection of boundary walls, stores, buildings, the taking up and relaying a water main. Mr. Ernest J. Price, clerk to the committee, Swell Villa, Stow-on-the-Wold, Glos.

TADCASTER.—Nov. 23.—For the construction of a corrugated iron administrative block, with drains, water pipes, and all other accessories, at the Infectious Diseases Hospital, Garforth, for the Tadcaster Rural District Council. Mr. H. M. Driver, sanitary surveyor, Garforth, near Leeds.

TRURO.—Nov. 30.—For erection of a new mill at Malpas Road, for Messrs. Hosken Trevithick, Polkinhorn & Co., Ltd. Deposit 2*l.* 2*s.* Mr. Alfred J. Cornelius, M.S.A., architect, Truro.

WALES.—For additions to Seabank Hotel, Porthcawl. Deposit 1*l.* 1*s.* Messrs. Cook & Edwards, MM.S.A., architects, Masonic Buildings, Bridgend.

WALES.—Nov. 21.—For erection of eight large houses at Pant, for the Pant Building Club. Mr. J. Llewellin Smith, M.S.A., architect, Aberdare.

WALES.—Nov. 21.—For erection of 100 workmen's houses, for the New Dynant Anthracite Colliery, Ltd., at Cwmmawr, Pontyberem. Mr. J. E. Burnell, 2 Frederick Street, Llanelly.

WALES.—Nov. 21.—For the construction of a post-mortem house and mortuary near the Dolau Subway, Llanelly. The Surveyor's Office, Town Hall, Llanelly.

WALES.—Nov. 23.—For additions and alterations to the Council school at Clarbeston, Pembrokeshire. The Headmaster of the school, and also Mr. D. E. Thomas, architect, 17 Victoria Place, Haverfordwest.

WALES.—Nov. 23.—For taking down and rebuilding school and chapel on the site of the Primitive Methodist Chapel and school, Cwmtillery, Mon. 1*l.* 1*s.* deposit. Mr. N. G. Lewis, F.I.A.S., architect and surveyor, Abertillery.

WALES.—Nov. 25.—For erection of a school at Gelli, to be known as Bronllwyn school, to accommodate 400 mixed and 400 infant scholars, for the Rhondda Urban District Council. Send 2*l.* 2*s.* to the Accountant, Council Offices, Pentre. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WALES.—Nov. 28.—For erection of twenty or more houses at Troedyrhiw, for the Troedyrhiw Building Club. Messrs. Johnson & Richards, architects, Merthyr Tydfil.

WALES.—Nov. 29.—For erection of a minister's house at Mynachlogddu, Pembrokeshire. The Rev. L. G. Young, Bryncleddau, Clynderwen.

WALES.—Nov. 29.—For erection of thirty-six houses, together with the construction of roads, drains, &c., at Troedyrhiw, for the Park Building Club. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WALES.—Nov. 30.—For erection of twelve houses, together with the construction of roads, &c., at Aberfan, for the Grove Building Club No. 2. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WALES.—Dec. 5.—For erection of the following buildings, viz.:—Refreshment room, kitchen, bowls house and shelter in Cwmdonkin Park; bowls' house in Victoria Park; bowls' house in Dyfatty Park; and bowls' house, kitchen and shelter in Llewelyn Park, for the Swansea Corporation. Deposit 2*l.* 2*s.* The Borough Estate Agent, 3 Prospect Place, Swansea.

WALES.—Dec. 6.—For erection of (*a*) fifty houses at Cwm Road, (*b*) fifty-three houses at Trewyddfa Common, Plasmarl, for the Swansea Corporation. Deposit 3*l.* 3*s.* The Borough Estate Agent, 3 Prospect Place, Swansea.

WARE.—Nov. 29.—For the following works at Stanstead pumping station, viz.:—Additions to engineer's cottage; (2) alterations to screening chamber of reservoir. Mr. H. Fox Hill, surveyor, Town Hall, Ware, Herts.

WELSHPOOL.—Dec. 8.—For erection of additions to the County schools, Welshpool. Deposit 1*l.* 1*s.* Messrs. Shayley & Ridge, architects, Oswestry and Welshpool.

WHEATLEY HILL.—Nov. 26.—For erection of new premises at Wheatley Hill, Durham, for the Sherburn Hill Co-operative Society, Ltd. Forward names by Nov. 26, to Mr. J. Walton Taylor, F.R.I.B.A., St. John Street, Newcastle-upon-Tyne.

WOODFORD.—Nov. 29.—For the supply and erection of a corrugated iron cart shed. Mr. William Farrington, surveyor, Council Offices, Woodford Green, Essex.

WORKSOP.—Nov. 25.—For erection of ten pairs of cottages on land at the Co-operative Garden City, Kilton Road. Mr. E. Allsopp, architect and surveyor, Sherwood Road, Worksop.

TENDERS.

BROADSTAIRS.

For erection of new business premises in High Street, Broadstairs. Mr. H. BERTRAM LANGHAM, architect, Broadstairs.

Martin	£2,736 0 0
May	2,670 0 0
Stiff	2,149 0 0
ELLIOTT & Co., Margate (*accepted*)	2,000 0 0

CARK-IN-CARTMEL (LANCS.).

For erection and completion of six semi-detached villas. Messrs. J. W. GRUNDY & SON, architects and surveyors, Ulverston.

Shuttleworth	£849 16 2
Neal	847 1 0
Birch	841 0 0
Keith	840 19 1
Ward	821 19 0
Wearing	810 5 7
Hutton	806 8 7
Jones	778 16 6
Clayton	777 16 6
Gaskarth	777 11 4
Dickinson	777 5 6
Simpson & Armer	776 19 9
Chippendale	775 9 3
Thoms	775 6 3
Burrell	774 18 1
Braithwaite	769 9 11
PARKINSON, Lancaster (*accepted*)	769 0 11
Architects' estimate	759 19 8

FORDHAM.

For erection of cottage on the Block Farm, for the Cambs. Small Holdings committee.

Tebbitt	£337 0 0
Cowell	277 0 0
Boon	265 0 0
FULLER, Burwell (*accepted*)	249 0 0

GODMANCHESTER.

For alterations and additions to the Council schools, for Hunts education committee. Mr. H. LEETE, architect.

Pettit	£615 0 0
Markham	610 0 0
Thackray & Co.	598 0 0
Allen & Sons	570 0 0
Pearson	558 0 0
Giddings	550 0 0
PAGE & SON, Buckden (*accepted*)	528 0 0

LONDON.

For alterations and additions to the Chemical Laboratories, for the Corporation.

Griffin & Co.	£234 0 0
Gallenkamp & Co.	198 10 0
BECKER & Co. (*accepted*)	172 0 0

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LONDON—*continued.*

For the supply of cooling fans and filter frames for use in connection with the working of the first two turbo-generators provided at the Greenwich generating station for the London County Council.

Davidson & Co.	£495	0	0
Sturtevant Engineering Co.	492	0	0
Keith & Blackman Co.	449	10	0
Westminster Ventilating Co.	425	0	0
Standard Engineering Co.	378	0	0
Matthews & Yates, Manchester (*recommended*)	374	0	0

For the reconstruction of the bridge over the London, Brighton and South Coast Railway, giving access to Norwood Park from Gipsy Road, for the London County Council.

Kavanagh & Co.	£717	6	0
Thorne & Sons	681	3	6
Rowlingsons & Co.	678	6	0
Pedrette	653	7	0
Mowlem & Co.	645	0	0
Muirhead & Co., 35 Queen Victoria Street, E.C. (*recommended*)	634	8	6
Chief Engineer's estimate	551	0	0

For necessary works to put the late Three Tuns public-house, Billingsgate Market, into tenantable repair, &c., for the Corporation.

Lidstone	£369	0	0
Porter	334	0	0
Johnson & Co.	291	0	0
Kilby & Gayford	285	0	0
Munday & Son	270	0	0
Candler & Sons	238	13	6
Inns (*accepted*)	236	10	0

PORTSMOUTH.

For erection of wall and iron fence around a portion of the workhouse land at Milton. Messrs. Rake & Cogswell, architects, Portsmouth.

Jones	£1,565	0	0
Croad	1,525	0	0
Crockerell	1,450	0	0
Woods & Co.	1,392	17	9
Corke, Portsmouth (*accepted*)	1,385	0	0

ROSS.

For erection of a new secondary school for boys and girls at Ross, Hereford. Messrs. Ashton & Small, architects, Ross.

Broad	£5,650	0	0
Deacon	5,649	1	5
Cooke	5,463	11	5
Jones	5,460	0	0
Nicholls	5,374	0	0
Collins & Godfrey	5,352	0	0
Wilks & Son	4,989	0	0
Griffiths	4,950	0	0
Powell & Son, Hereford (*accepted*)	4,835	7	0
Architects' estimate	4,928	0	0

WALES.

For the construction of a galvanised corrugated steel and timber boat-house, timber approach and reinforced and solid concrete lifeboat slipway at Porth 'Stinian, near St. David's, Pembrokeshire, upon or adjacent to the foreshore and sea-bed thereat, for the Royal National Lifeboat Institution. Mr. W. T. Douglass, M.I.C.E., engineer and architect, 15 Victoria Street, Westminster, S.W.

Harbrow	£3,997	14	2
Thorne & Son	3,950	15	0
Lester	3,531	0	0
Exors. of J. Arundel, Bradford (*accepted*)	2,998	3	0

For erecting twenty houses off Brompton Terrace, for the Vale View Building Club, Tredegar. Mr. A. F. Webb, architect and surveyor, Blackwood, Mon.

	Per House.		
Taylor	£219	0	0
Spencer, Santo & Co.	205	0	0
Rodgers	191	0	0
Colborne	189	0	0
Davies	189	0	0
Podden, Pengam (*accepted*)	174	0	0

WYCOMBE.

For enlargement of the hospital, for the Rural District Council.

Clarke	£1,367	0	0
Lane	1,256	0	0
Gibson & Son	1,188	0	0
Hunt & Son	1,141	0	0
R. H. Harris	1,028	0	0
Morton & Sons	1,070	0	0
J. T. Harris	999	0	0
Lovell & Son, Marlow (*recommended*)	994	0	0

THE SOCIETY OF ARCHITECTS.

On Wednesday, the 16th inst., the Society of Architects gave a successful house-warming party or conversazione in connection with the opening of their new premises at 28 Bedford Square, W.C. These are situated at the corner of Bayley Street and Bedford Square, and are most accessible, being within half a mile of eight tube stations. The house dates from the "Adam" period, and contains much typical work of that time. Particularly noticeable are the marble mantelpiece in the Secretary's office on the ground floor, and the ceiling in the Members' room on the floor above. The accommodation provided is as follows:—Basement—Library, housekeeper's rooms, cloak-room, and heating; ground floor, offices for the Secretary and staff, together with a committee-room; first floor, members' common room, council chamber, and lavatory. The rooms on the second and third floors have been adapted as apartments for a resident secretary. The contract for carrying out the necessary alterations was given to Messrs. Dove Bros., Ltd., whose tender amounted to 1,975*l*. The work was carried out according to the designs of Mr. Fitz-Roy Doll, the architect to the Bedford estate.

The Society held their opening meeting last night. A report of the proceedings will be given in our next issue.

Mr. Ralph Selden Wornum, F.R.I.B.A., of North Deal, and late of 26 Bedford Square, W.C., died on the 14th inst. at Deal, in his 64th year. The deceased acted on the Competitions and Prizes and Studentships Committees of the Royal Institute, and was an old member of the Architectural Association.

The Shoreditch committee for the preservation of the Ironmongers' Almshouses and Garden announce that they have raised the 2,000*l*. necessary to complete the purchase of the property.

The Surrey County Council decided last week, in conjunction with the Middlesex County Council, to widen Kingston Bridge over the Thames to a uniform width of 55 feet. The cost of the improvement, which will be borne by both Councils, is estimated at 109,000*l*.

The Newcastle Board of Guardians recently obtained the sanction of the Local Government Board for a workhouse hospital scheme, costing 18,700*l*., to provide 156 beds, and to permit of the proper classification of patients. Last week, however, it was decided not to proceed with this scheme, but to endeavour to secure permission for the erection of a temporary, or, at any rate, a cheaper building, which will provide for the needs of, say, the next ten or fifteen years.

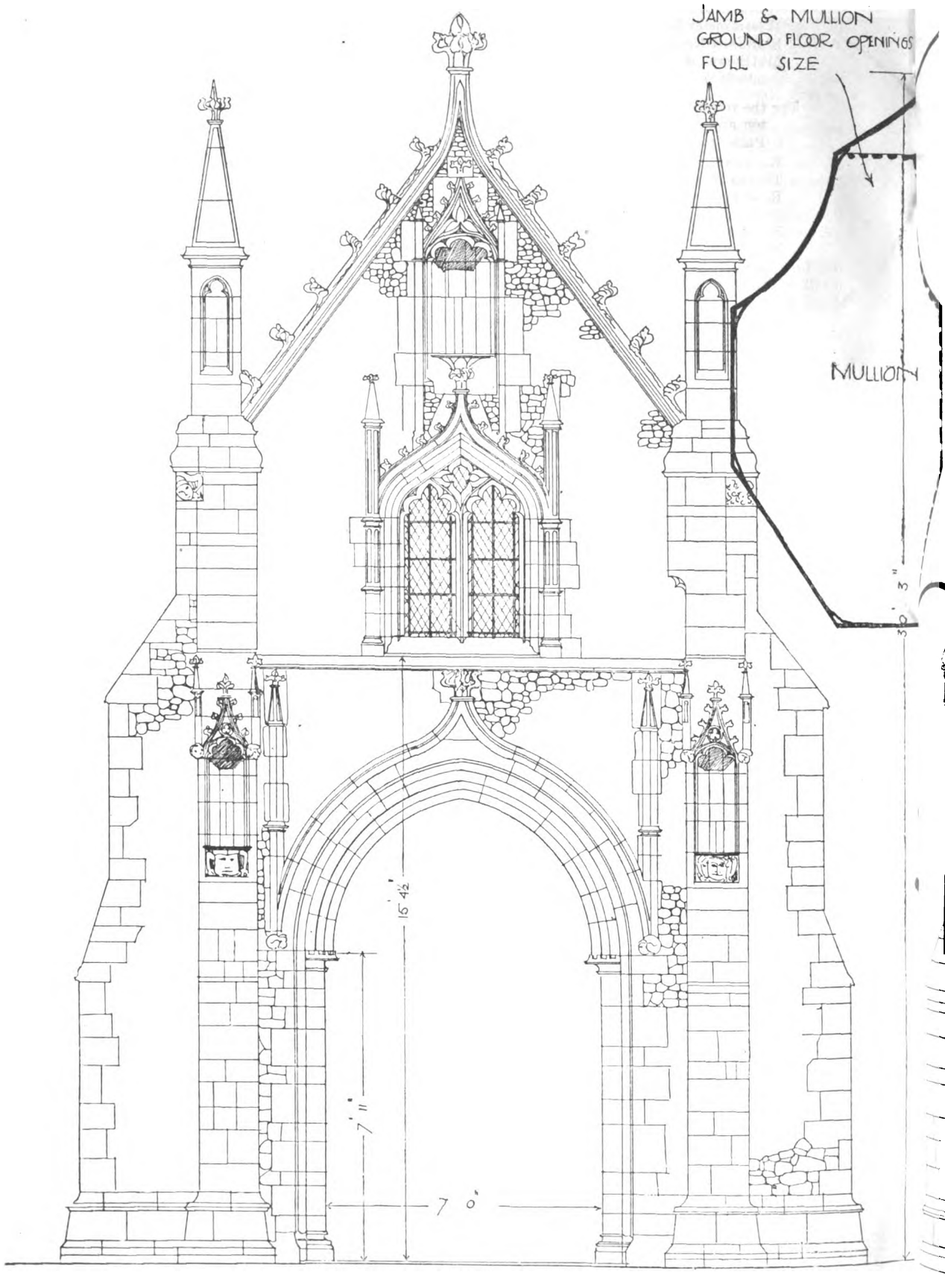
A difficulty is at present pending between the Aberdeen granite merchants and the American agents, which has for the moment put a stop to business between the two countries so far as manufactured granite is concerned. It seems, according to the *Glasgow Herald*, that despite high tariffs the middlemen in America—who conducted the whole of the business with America—have been gradually reducing prices to such an extent that little or no profit was left for the manufacturer. The Aberdeen merchants have now given notice that no orders will be accepted for Canada and the United States except at an increase of 15 to 20 per cent., according to the class of the order. It was put forward by the American agents that the class of work supplied by the granite merchants on this side was of an inferior character, the answer to that being that first-class work could not be given at the prices allowed. The Americans also contend that due notice of the increased prices ought to have been given, while the Aberdeen granite men reply that no notice was given to them of the decreases which had been put in force from time to time. Meantime the Aberdeen granite merchants have bound themselves under a penalty not to execute orders for Canada and the States except at the increases mentioned.

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"THE ARCHITECT" STUDENTS'

LEVERINGTON · CHURCH - CAMBS · THE - SOU

SCALE ½" - ONE FOOT

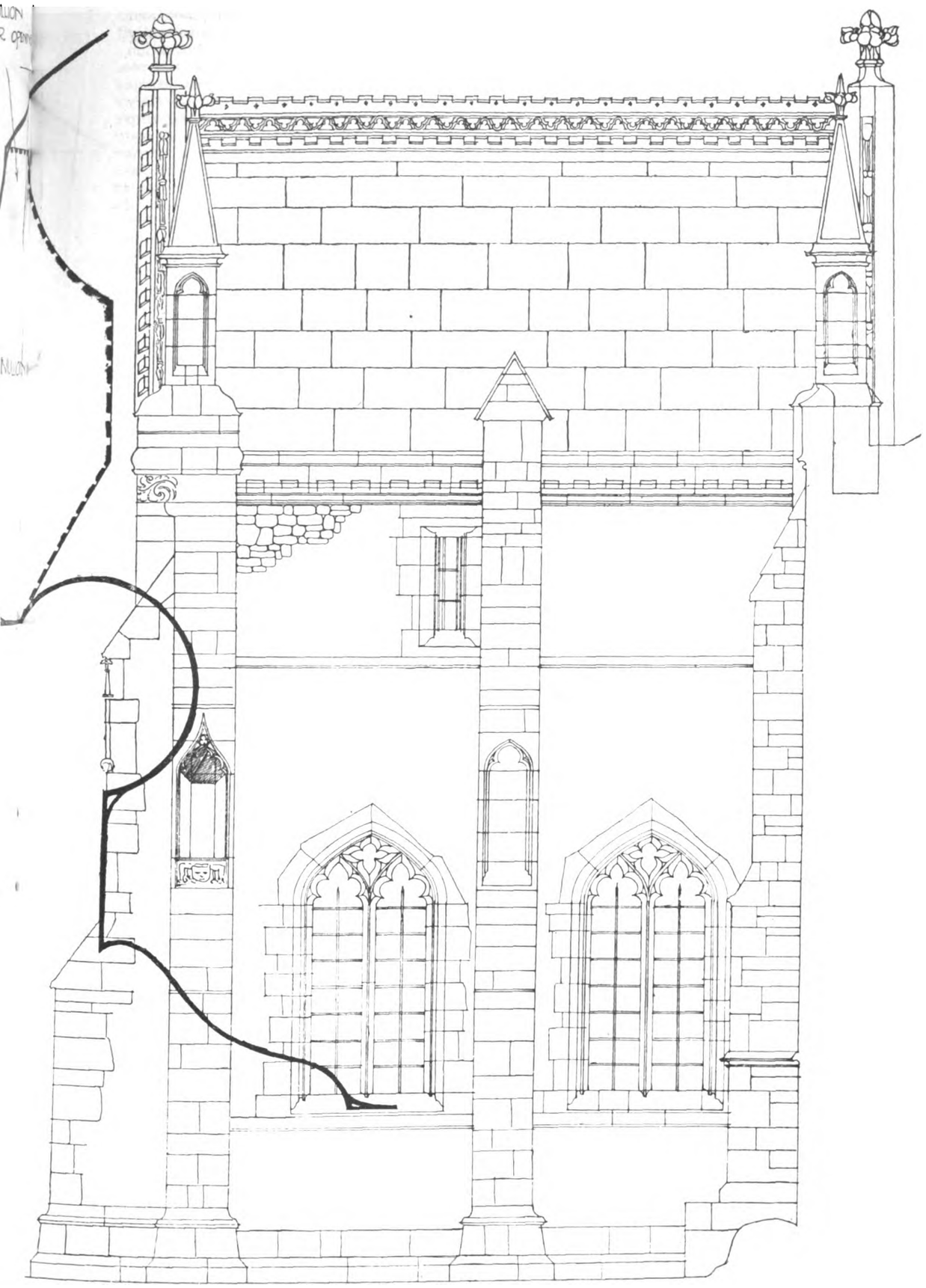


FRONT - ELEVATION

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S.-SOUTH - PORCH



SIDE ELEVATION

BY "SANS PEUR."

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LEVERINGTON CHURCH, CAMBS.—THE SOUTH PORCH.

THIS porch is a good and interesting example of fourteenth-century work. Up to 1888, when it was restored by the late Mr. Pearson, it was in a very dilapidated condition. It was almost entirely covered with plaster, which when stripped from the vaulting showed the filling in to be of brick, which was replaced by stone. The tracery of the window in the parvis, which had been removed, was replaced. The pierced ridge is original and an interesting example. The whole porch forms a very interesting study, the detail being very good. The church is of the typical parish church plan with a fine western tower.

PREVENTION OF DRY ROT IN TIMBER.

FIFTY years ago Professor John Rankine wrote in his "Civil Engineering":—

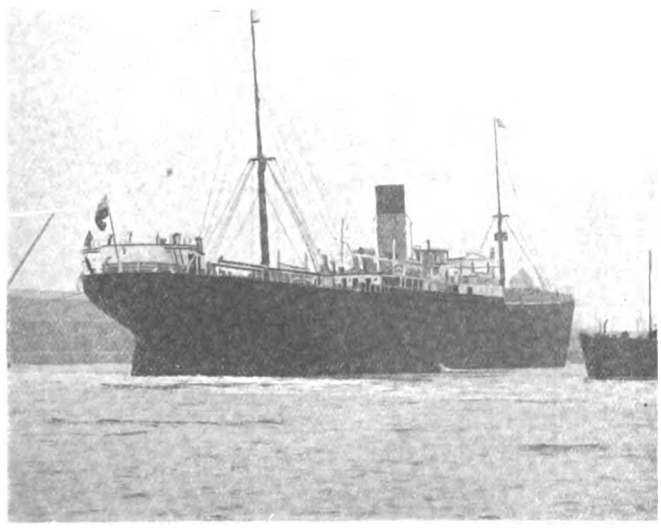
"Among the many processes for the prevention of dry and wet rot in wood by impregnating it with a material capable of precipitating its coagulate constituents in a permanent, insoluble form are the following . . ."

The list given is surprisingly lengthy.

One of the few processes for the prevention of dry rot in wood, which has survived the searching test of half a century, is that of Sir William Burnett, which was introduced some seventy years ago. Since then there have been marked advances in the commercial application of chemistry, and Sir William Burnett & Co., Ltd., are now reaping the benefit of their research and experiments.

The preservative originally used consisted of a solution of a heavy metal salts. It was found by them, however, that in the course of time this metal salts had a tendency to wash out, and it was only after continuous experiments and tests over a great number of years that this was prevented, until at last, Burnettizine, the preservative employed, is as much improved as the method of applying it. The difficulty to overcome was not only to make a preservative that was uninflammable and odourless, but to make a chemical compound in such proportions, which besides having these properties, would, when employed in solution and forced into timber under pressure, act on the albuminous and nitrogenous matter and form a chemical compound that would not wash out, and thus prevent decay.

There can be no doubt that in its early history the permanence of Burnettizing, and all similar processes, was open to suspicion. The work, obviously, did not go far enough to offer other than temporary resistance to the ills to which wood is subject: but once the great initial step had been taken, it was not an insurmountable matter to carry the process forward by means of research, until the vital shortcoming was rectified.



In the old days the timber to be treated used to absorb the preservative as well as might be by soakage; whereas now it is placed in a cylinder and, after a vacuum has been created, the preservative is forced into the very heart of the timber under high pressure. The mechanical part of the process is, of course, identical with that followed in creosoting. But valuable as creosoted wood is, timber so treated cannot be utilised for any and every purpose. In many places where it is debarred Burnettised timber can be introduced, and at about the same cost. "Burnettizine" is described as a powerful odourless germicide which is impregnated into timber under pressure, and forms an insoluble compound with the albuminous matter in the wood, preventing it from fermenting and making dry rot impossible. It also renders the wood practically fireproof, and considerably hardens it. Its effectiveness under abnormally trying conditions is shown by the accompanying illustration of s.s. *Star of Canada*, where it is employed for the refrigerating chambers. Several of the largest installations for refrigerating have been fitted with Burnettised (Dry Rot-proof) timber, including those controlled by steamship companies like the Star, Nelson, and Aberdeen Lines. Another somewhat similar use was in the H.M. Government War Office Cold Storage in Gibraltar. At Manchester Infirmary it was used in the refrigeration installation after the previous wood had become affected by dry rot. Four of the underground railways in London employ it successfully.

But the preservative is specially recommended for building work, in which dry rot comes like an enemy in the night unless precautionary steps are taken. Architects have, of course, been held in the courts responsible in certain cases for its appearance. Therefore it behoves them to fully protect themselves by specifying, where possible, "Timber to be preserved under pressure with Sir William Burnett's Preservative Burnettizine." The process is carried out by Sir William Burnett & Co., Ltd., at their Burnettizing and Creosoting Works at Nelson Wharf, Millwall, London, and by their agents, Messrs. James P. Corry & Co., Ltd., Prince's Dock, Belfast, and Messrs. Hall Bros., Ltd., Tyne Dock, South Shields.

HOLBORN TO STRAND L.C.C. IMPROVEMENT.

AT the ordinary meeting of the Institution of Civil Engineers on Tuesday, November 8, Mr. Alexander Siemens, president, in the chair, the paper read was "The London County Council Holborn to Strand Improvement and Tramway Subway," by G. W. Humphreys, M.Inst.C.E. The following is an abstract of the paper:—

The subject of the paper is the carrying out of the largest scheme of street improvement ever effected in London, having as its result the establishment of through communication between north and south London, the removal of one cause of congestion of traffic passing from east to west, and the purging of the insanitary areas lying in a portion of Central London. In addition to the amenities thus afforded to vehicular and pedestrian traffic, the construction of a shallow tramway subway (the first of its kind in London, or, indeed, in England) has succeeded in effecting a junction between the tramway systems north and south of the Thames, which previously had seemed to be impossible, owing to the main arteries of traffic to be crossed and the disinclination of the authorities to allow tramways in what may be called Central London.

The scheme in question, which may be described as the amalgamation of three distinct and separate endeavours, consists of, first, the widening of the Strand between Wellington Street and the Law Courts; secondly, the construction of a new main thoroughfare, 100 feet wide and about 3,000 feet long, from the Strand to Holborn, intersecting the numerous narrow and squalid streets formed in the past according to no recognised scheme of planning; and, thirdly, the widening of Southampton Row in continuation of the new street. There is, further, the construction under the new street of a shallow tramway subway, and its continuation under the Strand and Wellington Street to the Victoria Embankment, thus enabling tramcars from the northern system to pass through the subway, from its egress into Southampton Row near Theobald's Road, to the Embankment, and thence, *via* Blackfriars or Westminster Bridge, on to the southern system.

The whole of the works, both of street and subway construction, were, with some slight exceptions, executed by the London County Council by the direct employment of labour through its late Works Department, of which the author was chief, and to the designs of and under the general supervision of Mr. Maurice Fitzmaurice, the London County Council's chief engineer.

The formation of the new street calls for little comment, save for the fact that the work had to be spread over some time, and a great deal had to be carried out in crowded thoroughfares. In connection with the formation of the

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street, however, the electric power, gas, water, and other mains and pipes had to be carefully preserved, with a view to their reception in the subways formed beneath the new thoroughfare, and the diversion of old and the construction of new sewers formed also an important part of the undertaking. It is noteworthy that during the progress of the work practically no interruption to vehicular traffic was caused, nor was diversion of traffic necessitated, particular care being taken to provide access for vehicular traffic on the main roadways affected by the improvement.

The construction of the subway, however, is of more interest from the engineering point of view. The main portion was constructed in "cut and cover," but the portions under Holborn and under the Strand and Wellington Street were constructed by means of a shield. The portion of the undertaking which called for the greatest care was the subway under Wellington Street, a thoroughfare found to be constructed on brick arches, the piers of which had to be cut at varying angles to admit of the formation of the subway. The normal roofing of the subway is steel troughing, a brick arched roof being substituted in the deeper portions; the walls are composed of Portland cement concrete, with an envelope of ¾ inch of mastic asphalt embedded in the concrete. A double line of tramrails is laid in the subway, and two stations, the entrances to which are utilised also as street refuges, in Kingsway afford means of access to the tramways.

The magnitude of the undertaking may be judged by the fact that the gross cost is approximately 6,078,324*l*., of which 385,041*l*. was for works, which were executed well within the limit of the estimates of the Council's officers. Tables in an Appendix to the paper give details of the cost of the acquisition of properties and the execution of works, with particulars of cost of some of the more important items of the latter.

The paper does not discuss any theories or comment upon the general policy that has led to the undertaking, but presents a detailed account of the construction and finished works, and, in addition, gives some particulars of the steps leading up to the acquisition of the necessary Parliamentary powers.

LONDON MASTER BUILDERS' ASSOCIATION.

A COUNCIL MEETING was held at Koh-i-Noor House, Kingsway, W.C., on Thursday, the 10th instant, Mr. Leonard Horner (President) in the chair.

Report was received from the Committee on the L.C.C. suggested building regulations in connection with reinforced concrete construction.

A long discussion took place on the land value duties, together with their effect upon the building industry, and the matter was referred to the Committee for further consideration.

The Organisation Committee's Report was received, and new members were elected.

Final instructions with regard to the composition of the "Diary and Hand Book" were given, and the book will be issued the first week in January 1911.

The requisition made to the Authority by the Council as regards measurements of slating and roof tiling has been agreed upon, and the new method of measurement will take place from January 1, 1911.

The question of apprenticeship was again discussed, and the movement is receiving very favourable support.

Members were elected to fill certain offices on the National Federation of Building Trades Employers of Great Britain and Ireland.

THE BUILDING TRADE IN BIRMINGHAM.

IN their report presented at the annual meeting of the Birmingham Building Trades Employers' Association, the Executive Council state that during the year, though business in other trades had greatly improved, the building trade had, so far, not responded to the general commercial improvement. They were pleased to report that the King's Norton and Northfield Master Builders' Association had become affiliated to the Association, and that they were represented on the Council by two members. The working rules of the King's Norton and Northfield Association would under the arrangement entered into be identical with those of Birmingham, and in all cases of dispute between operatives and members of the former Association occurring within the five mile radius belonging to the Birmingham district two duly appointed members of the King's Norton Association would take the places of two Birmingham members on the local conciliation board. Early in the year the General Purposes Committee of the City Council, after considering representations from the Birmingham and District Trades Council, proposed a modification of the general conditions to be inserted in Corporation contracts with regard to the payment of the standard rate of wages. The Council considered that the modified conditions were not fair, and subsequently a deputation had an interview with the General Purposes Committee. As a result it was decided to alter the conditions so as to provide that the principal contractor should not be responsible for the observance of the conditions with regard to wages, hours, and conditions of labour in the case of a sub-contractor nominated by the Corporation.

THE PROBLEM OF THE ARCHITECT'S ASSISTANT.*

IF those of my hearers who happen to possess a copy of Dr. Johnson's Dictionary will turn to its learned compiler's original preface they will find in the opening sentence the following excellent specimen of Johnsonian English, which I have often thought might be fittingly inscribed on the articles of pupilage of many a budding aspirant to the title of architect. The passage runs as follows:—

"It is the fate of those who toil at the lower employments of life to be rather driven by the fear of evil than attracted by the prospect of good, to be exposed to censure without hope of praise, to be disgraced by miscarriage or punished for neglect where success would have been without applause and diligence without reward. Among these unhappy mortals is" not only "the writer of dictionaries," but too often, I am afraid, the maker of drawings, the architect's assistant.

There are few of us, no doubt, who in the springtime of our hopes would not have scornfully rejected the notion that his labours could be described as belonging to the lower employments of life, or who would not have felt that if he was not destined, like Sir John Vanbrugh, to lay many a heavy architectural load on his mother earth, could at least look forward to considerably improving the artistic surroundings of the district which he should favour with his labours. But the chastening effect of contact with the actual conditions of architectural practice teaches us to take a less exalted view of our position, and has even induced in some of us the fear that unless we take heed we may be left with no employment at all save that of casual labourers.

They who sit at the feet of the architectural Gamaliels of Conduit Street, "nourishing a youth sublime, with the fairy-tales of art and the long result of time," a very wholesome practice in its way, must, I fancy, be at times struck by the great difference of scale between the huge size of the canvas which is stretched before them and the small opportunities that are offered to them for working on it. The architect as an artist is, indeed, placed in a most unfortunate situation for the exercise of his talents when compared with other artists. A few shillings will furnish the sculptor or painter with all the materials necessary to produce a masterpiece. Give the literary artist but pens, ink, and paper and he may make a continent ring with his name. All can put their wares upon the market at comparatively little cost. But before the architect can even truly call himself such he must first find a man with a substantial balance at the bank who will trust him with the spending of it.

This little difficulty is one which is not usually pressed upon the notice of the aspiring pupil, nor is it, indeed, much referred to at any time, but is allowed to gradually burn itself into the inner consciousness of those who have entered the profession. But this process of burning in is so extremely effective that it develops in us a special faculty for scenting possible jobs from afar off—a faculty which in some most successful practitioners may be said to amount almost to a sixth sense, while those who are quite unable to develop it are generally doomed to an obscure fate. The difficulty is one which is so inherent in the practice of architecture that for my own part I am unable to see how any number of Registration Bills or any system of architectural training will ever succeed in abolishing it; but that the difficulty may be minimised and kept within reasonable bounds I have no doubt, provided only it is fairly and frankly faced. It is a difficulty which presses both on the principal and the assistant, but more especially upon the

* A paper read by Mr. J. V. Hibbert, F.S.I., at a meeting of the Guild of Architects' Assistants, on November 8.

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latter, because it is the principal reason of his remaining an assistant. Yet the assistant has so far done nothing towards relieving himself, beyond that mere passive form of combination in which the interests of the principal are assumed to include those of the assistant. As a matter of fact, the practising architect is himself too often engaged in a hand-to-hand struggle for recognition to have much time to spare for considering the position of his assistant, and unless that gentleman is prepared to look after his own interests he is more and more likely to be pushed aside in the struggle.

The signs are now everywhere apparent that the practising architect, for his part, is determined to make a move in the matter, and to call, if need be, on Parliament to help him to pull his cart out of the rut; and when Parliament is not too busily engaged in pulling its own cart out of the rut it may possibly listen to him. But in the meantime the architect's assistant stands like a disinterested spectator, with every good wish for the vociferating principal, but otherwise rather amused by the commotion he is making than concerned to inquire how the issue is going to affect himself. It appears to me and to the founders of this Guild that he would be better employed in putting his own shoulder to the wheel and giving a direction to the cart, since he is bound to follow it.

The problem, then, is how and in what direction his efforts should be applied. It can only be solved by a serious and united endeavour on the part of the body of assistants to see clearly what the position is, to thresh out by discussion, by criticism, by contradiction, a possible solution of the problem, and to this end this Guild of Assistants has been formed, in the hope that it will at least furnish a base from which these operations can be started.

It may be questioned whether there is any need for calling into existence for this purpose another body within the profession. We may say in answer that, while we desire to co-operate in every way consistent with the objects we have in view with all the existing architectural societies, we conceive that none of the existing bodies occupies in practice the ground which we are endeavouring to cover.

The Royal Institute of British Architects is avowedly and mainly concerned with the advancement of the art of architecture. While we also are fully conscious of the reverence which is due to our art, we feel that we can safely leave its protection in the hands of the august and powerful body which has already taken charge of it, and we propose to devote our energies to the practical advancement of the interests of the architect's assistant, and by so doing believe that we shall advance the interests of the profession at large.

The Institute, in the long and honourable contest which it has maintained in upholding the cause of architecture, has set up an ideal which is far above the heads of the general public, and perhaps a little beyond the reach of the average practising architect himself, who finds small encouragement in pursuing it while faced with the troublesome necessity of earning a living. Both the architect and his assistant must live, and though some unkind critic may question the necessity, it is an ever-present anxiety to ourselves. In this matter the interests of the architect and his assistant are identical, and it is on this point that we claim the support of the practising architect for this Guild of Assistants.

Now, while the Institute has done so much for the advancement of the art of architecture, and has drawn to itself the ablest and most important members of the profession and the support of a large number of practising architects and their assistants, it is a curious fact that when it descends to the consideration of any of the practical difficulties and troubles which afflict the practice of architecture its efforts are not usually crowned with any conspicuous success.

The comparative failure of the Institute to dominate the relations between the architect and the general public may be ascribed to various causes, which, however, I do not propose to discuss. But that there is a want of driving power in the edicts of the Institute, even as regards its own members, is, I think, unquestionable. Now in all these, of education, of the status and conduct of the profession, the voice of the assistant has never been raised, notwithstanding the fact that he is largely concerned in all of them. He has hitherto been content to leave everything in the hands of those he has looked up to as his leaders, and, while supporting the organisations of his chiefs, he has never considered the advisability of organising on his own account, or whether, in fact, he was being led in the right direction. Now let us consider what it is that the qualified assistant wants.

His first and constant aim is to cease to be an assistant and to become a practising architect, and put up buildings on his own account. Next to that he desires employment for his services as an assistant to men who will give him both fair payment and credit for the work he does for them. His chances of achieving either of these ends are at the present moment very infrequent, nor is there any body, so far as I know, at present concerned in improving them. Quite apart from the long and recurring periods of depression in the building trade, there are, as we know, other causes at work. But even if there were not, if all we had to consider were the inevitable fluctuations of prosperity, which afflict all alike, it were only common prudence to endeavour to provide for them. A properly organised register of unemployment and a system of insurance are surely worth consideration. A properly conducted register of unemployment would be of incalculable benefit to the whole profession, and would form a means of communication between the principal and assistant which is very badly needed. The methods at present open to an assistant of obtaining work when out of employment are of the crudest description, and consist either of advertisement in the weekly Press or undertaking a pilgrimage round the offices that he knows of. The principal in need of an assistant has to adopt equally crude methods, as a rule, in getting hold of the kind of man he wants, and has often to put up with repeated disappointments before achieving the desired result.

(To be continued.)

VARIETIES.

It is proposed by the All-Red Route Line to construct a pier at Holyhead at a cost of 60,000*l*. The Board of Trade are also going to expend between 60,000*l*. and 80,000*l*. at the same port on the repair of the breakwater.

A Local Government Board inquiry was held at Cleethorpes on the 9th inst. into an application by the Council for sanction to borrow 58,000*l*. to be expended on a sewerage scheme.

The Maldens and Coombe Urban Council is applying for sanction to loans of 3,000*l*. and 540*l*., for a refuse destructor and additional sewage pumping plant, the destructor to generate the steam power.

The Chevalier Professor C. Formilli will, as mentioned in our issue of last week, read before the R.I.B.A. on the 28th inst. a critical and historical paper, illustrated by lantern slides, on the Cosmati mosaic and marble workers who were called from Rome to Westminster Abbey to build and decorate the shrine of Edward the Confessor, the tomb of Henry III., and other tombs, and to make the mosaic pavement before the altar and in the sanctuary. There will be on view the same day in the galleries of the Royal Institute an exhibition of full-size coloured reproductions of the above works, executed under the direction of Professor Formilli, by order of the Italian Government for the forthcoming International Exhibition of Art to be held in Rome in 1911.

The Coventry City Council at a special meeting on the 14th inst. decided to include in the Bill to be promoted next session the scheme for constructing a new street from Broadgate to Hales Street and through the Chauntry to Stoney Stanton Road, and so relieve the heavy and increasing traffic from the north-east of the city to the centre. The scheme is for a thoroughfare 60 feet wide, and the city engineer in his report suggested that 72 per cent. of the total tram service might be diverted in that direction. Three public-houses and three slaughter-houses are proposed to be removed, as well as the dilapidated Chauntry area.

The Durham education committee advise works at the following elementary schools:—(1) Oakenshaw, a new school to cost 6,517*l*.; (2) West Cornforth, a new school to cost 9,235*l*.; (3) West Stanley (*a*) The replacement of the existing iron school at Greencroft by a new school for 900 scholars at an estimated cost of 11,750*l*., (*b*) a school at or near Collierley for 600 scholars at an estimated cost of 8,793*l*., (*c*) a school at West Stanley for about 850 scholars to cost 12,830*l*., (*d*) a school at Annfield Plain for about 600 scholars to cost 9,090*l*., (*e*) an infants' school at Oxhill for about 220 scholars, at a cost of 3,120*l*.; also the remodelling of the existing Oxhill Council school so as to make the whole of the premises suitable and available for older scholars only; (4) Silksworth, a new school to cost 4,500*l*.; (5) West Boldon, a new school to cost 6,500*l*.; (6) Stanley (Crook), the enlargement of present school, or the erection of a new one at a cost of 7,500*l*.

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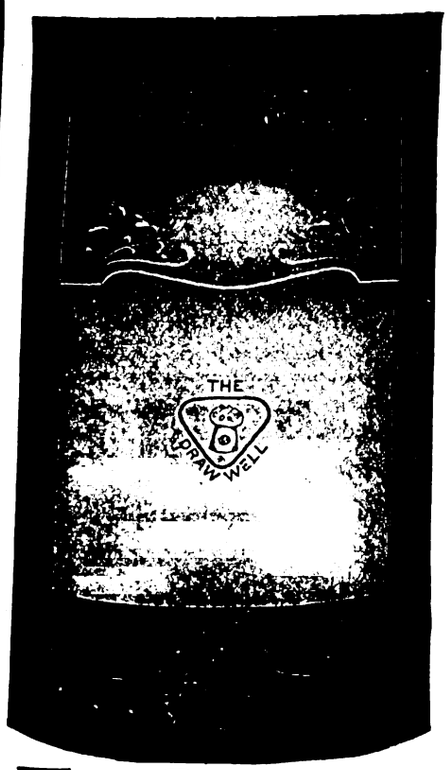
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The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

*** *As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

Bournemouth.—Dec. 1.—Designs are invited for rebuilding J. E. Beale's premises, Bournemouth. Premiums of 100*l.*, 50*l.*, and 25*l.* Deposit 1*l.* 1*s.* Mr. J. Elmes Beale, owner, Bournemouth. (For further particulars see advertisement Sept. 16.)

Coventry.—March 1.—The Corporation contemplate the erection of municipal offices in the centre of the city, and also possibly a town hall, and accordingly invite competitive designs. Mr. E. Guy Dawber, F.R.I.B.A., will act as assessor. Deposit 2*l.* 2*s.*, which will be refunded on receipt of a bona-fide design or if the particulars are returned within fourteen days of receipt. Mr. Geo. Sutton, town clerk, 10 Hay Lane, Coventry. (For further particulars see advertisement, November 18.)

Cuba.—April 15.—An international competition has been arranged for a Presidential Palace to be erected at Havana at a cost of about 205,000*l.* Premiums of 10,000 pesos and 5,000 pesos will be awarded. Conditions may be seen at the Cuban Legation, 3 Grosvenor Mansions, Victoria Street, S.W., or the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C.

Ireland.—Dec. 1.—The chairman and managing committee of the Royal Hospital for Incurables, Donnybrook, Dublin, invite designs in competition from architects in practice in Dublin for the building of a new pavilion for incurable consumptive patients, and additions to the existing hospital and buildings. Full particulars will be sent on written application to the Registrar, Royal Hospital for Incurables, Donnybrook, Dublin.

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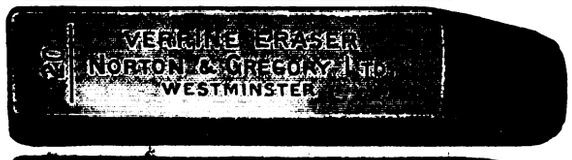
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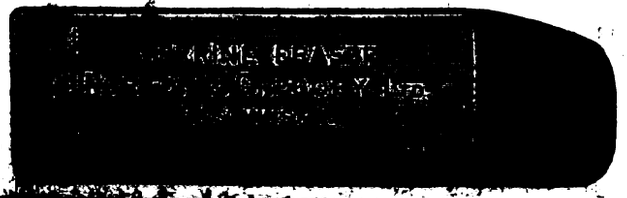
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MANCHESTER.—Dec. 1.—The Corporation invite plans, specifications, and estimates for the laying out of their Blackley Estate. Deposit 3*l.* 3*s.*, returnable on receipt of a bona-fide design. Premiums of 150*l.*, 100*l.* and 50*l.* The City Surveyor's Office, Town Hall, Manchester.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Class IV.—Town plan of Gidea Park—prizes of 100*l.* and 50*l.* Class V.—Garden design for house or cottage in Classes I. or II.—prizes, 25*l.* and 10*l.* Class VI.—Perspective drawing, suitable for reproduction of a cottage entered for competition in Class I. or II.—prizes, 10*l.* and 5*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs—Classes V. or VI., November 30; Class IV., March 31, 1911. Mr. Michael Bunney, A.R.I.B.A., hon. secretary, 33 Henrietta Street, Strand, W.C.

RUISLIP.—Nov. 30.—The Garden Estates, Ltd., invite designs for a town plan of the Estates of King's College, Cambridge (1,300 acres) situated in the urban district of Ruislip and Northwood. Assessors, Sir Aston Webb and Mr. Raymond Unwin. Premiums of 150*l.*, 100*l.*, and 50*l.* Deposit 1*l.* 1*s.*, which will be returned on receipt of a bona fide design or if particulars are returned within fourteen days of receipt. Conditions, &c., may be obtained after Sept. 1, from the Garden Estates, Ltd., 33 Henrietta Street, Covent Garden, W.C.

SOUTHPORT.—The Corporation invite architects practising in Southport to submit designs for a new public elementary school at Churchtown. Premiums of 50*l.*, 25*l.*, and 15*l.* will be paid to the authors of the first, second, and third successful designs. Full particulars, &c., may be obtained from Mr. J. Ernest Jarratt, town clerk, Town Hall, Southport.

TAUNTON.—Jan. 21.—The education committee invite architects, practising in the Borough of Taunton, to submit competitive designs for a provided school for 440 children. A block plan of site, together with conditions and instructions, may be obtained on application. No premium is offered, but the author of the selected design will have the carrying out of the work at 5*l.* per cent. Mr. George H. Kite, town clerk and clerk to the borough education committee, Municipal Buildings, Taunton.

WALES.—The Directors of the Oakdale Navigation Collies, Ltd., Tredegar, Mon., offer a prize of 100 guineas for the best set of plans for the building of a model village. Mr. A. S. Tallis, general manager, Oakdale Navigation Collieries, Ltd., Tredegar, Mon.

CONTRACTS OPEN.

ASHBURTON.—Dec. 3.—For pulling down and re-building house and shop, North Street. Mr. H. V. Foot, Biala, Ashburton, Devon.

BACKBARROW.—Dec. 6.—For the whole or separate works required in erection of eight cottages, in two blocks of four each, for Backbarrow Co-operative Society. The Society's Stores, Backbarrow, Lancs.

BARNET.—Dec. 5.—For erection of twenty-nine cottages in Mays Lane, for the Urban District Council. Deposit 1*l.* 1*s.* Mr. W. F. Wilkins, surveyor to the Council, 40 High Street, Barnet.

BRISTOL.—Dec. 7.—For the construction and maintenance for twelve months after completion of additional transit sheds at the Royal Edward Dock, Avonmouth, for the docks committee. The contract includes timber piling, concrete foundations, timber floors, steel stanchions, roof principals, and galvanised corrugated iron covering. Mr. W. W. Squire, engineer, Cumberland Road, Bristol. Send a deposit of 5*l.* to the Secretary of the Docks Committee, Dock Office, 19 Queen Square, Bristol.

BUXTON.—Dec. 10.—For proposed alterations to Old Wye House, for the Derbyshire education committee. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

CHARLES.—Dec. 10.—For erection of a house and offices for the Baptist Church, at Brayford, in the parish of Charles, North Devon. Mr. Thomas Carnell, architect, The Manse, Brayford.

FEATHERSTONE.—Nov. 30.—For erection of two new heating chambers at the Featherstone Council schools, near Pontefract. Mr. Charles Harris, divisional clerk, Education Offices, Knottingley.

FITZ MILL.—Dec. 9.—For re-building the bridge at Fitz Mill, near Shrewsbury. The Atcham Rural District Council. Mr. E. P. Everest, clerk, Council Offices, St. John's Hill, Shrewsbury.

GUILDFORD.—Dec. 3.—For small alterations and additions to the Board room and to the adjoining building at the Workhouse. Mr. E. L. Lunn, architect, 36 High Street, Guildford.

HALIFAX.—Dec. 5.—For the various works required in erecting doctor's residence, with motor house, &c., on the West Royd Estate, Kingcross. Messrs. Medley Hall & Son, architects, &c., 1 Harrison Road, Halifax.

HARRINGTON.—Nov. 29.—For building a stone wall to bound the site of the proposed cemetery at West Ghyll End, High Harrington, Cumberland. Mr. C. Eaglesfield, surveyor, Gordon Street, Workington.

HAWKSWORTH.—Nov. 29.—For the various works required in alterations and additions to the Bradford Golf Clubhouse at Hawksworth, near Guiseley, Yorks. Mr. A. R. Hill, A.R.I.B.A., architect, 23 Piccadilly, Bradford.

HOLYHEAD.—Nov. 28.—For the execution of certain alterations and additions to the Victoria Hall, Market Street. Mr. Jos. Owen, F.R.I.B.A., architect and surveyor, Exchange Chambers, Holyhead.

LEEDS.—Nov. 30.—For the erection of two hostels for men students at the City of Leeds Training College, Beckett's Park, Headingley. Deposit 2*l.* 2*s.* Send names at once to Mr. S. D. Kitson, architect, Vicar Lane, Leeds.

LONDON.—Dec. 2.—The Commissioners of H.M. Office of Works and Public Buildings are prepared to receive tenders for the new public offices Westminster extension first contract—foundations, vaults, &c. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London S.W.

LONDON.—Dec. 7.—For alterations and additions to the steward's office at the Northern (Convalescent) Fever Hospital, Winchmore Hill, for the Metropolitan Asylums Board. Deposit 1*l.* Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, the Office of the Board, Embankment, E.C.

LONDON.—Dec. 12.—For repairs and painters' work to the exterior of the Whitfield Street Baths, for the St. Pancras Borough Council. Mr. C. H. F. Barrett, town clerk, Town Hall, Pancras Road, N.W.

LYMM.—Dec. 5.—For alterations and additions to Lymm Grammar School, Cheshire. Deposit 1*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

NEWCASTLE-UPON-TYNE.—Nov. 29.—For alterations at Bentinck Council School. The Secretary, Education Offices, Northumberland Road, Newcastle-upon-Tyne.

OLDHAM.—Nov. 29.—For the construction of a bowl house and shelter, &c., at Copster Hill Recreation Ground. The Borough Surveyor's Office.

SCOTLAND.—Nov. 30.—For the mason, joiner, plasterer, plumber and painter work to be executed at Annan Manse. Mr. C. Watson, heritors' clerk, Annan.

SCOTLAND.—Dec. 13.—The Commissioners of H.M. Works and Public Buildings are prepared to receive separate tenders for the execution of:—(1) Excavator, mason and bricklayer works; (2) carpenter and joiner works; (3) ironfounder, smith, and ironmonger works; (4) slater work; (5) plasterer work; (6) plumber and gasfitter works; (7) painter, paperhanger, and gilder works; (8) glazier work; (9) blindmaker and bellhanger works in connection with ordinary works and repairs to buildings in their charge in (1) Edinburgh, (2) Glasgow, (3) Aberdeen, (4) Stirling, for three years from January 1 next. Mr. W. T. Oldrieve, H.M. Office of Works, Edinburgh.

SHEFFIELD.—Nov. 29.—For the supply, delivery, and erection of coal shoots for the Neepsend generating station. Deposit 1*l.* 1*s.* Mr. S. E. Fedden, general manager and engineer, Corporation Electric Supply Department, Commercial Street, Sheffield.

TRURO.—Nov. 30.—For erection of a new mill at Malpas Road, for Messrs. Hosken Trevithick, Polkinhorn & Co., Ltd. Deposit 2*l.* 2*s.* Mr. Alfred J. Cornelius, M.S.A., architect, Truro.

WALES.—Nov. 28.—For erection of twenty or more houses at Troedyrhiw, for the Troedyrhiw Building Club. Messrs. Johnson & Richards, architects, Merthyr Tydfil.

WALES.—Nov. 29.—For erection of a minister's house at Mynachlogddu, Pembrokeshire. The Rev. L. G. Young, Bryncleddau, Clynderwen.

WALES.—Nov. 29.—For erection of thirty-six houses, together with the construction of roads, drains, &c., at Troedyrhiw, for the Park Building Club. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

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WALES.—Nov. 30.—For erection of twelve houses, together with the construction of roads, &c., at Aberfan, for the Grove Building Club No. 2. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WALES.—Dec. 1.—For erection and completion of certain sections of the first portion of the proposed buildings at Aberystwyth, for the Council of the National Library of Wales. Send in names by Dec. 1 to the Librarian, National Library of Wales, Aberystwyth.

WALES.—Dec. 2.—For the following works, for the Trustees of the Siloh Chapel, Nantyffyllon:—(1) Erection and alteration of out-buildings, &c., new ventilators and repairs; (2) painters and decorators' work; (3) medium pressure hot-water heating apparatus. Messrs. Evans & Jones, architects and surveyors, 5 Station Road, Port Talbot.

WALES.—Dec. 5.—For erection of the following buildings, viz.:—Refreshment room, kitchen, bowls house and shelter in Cwmdonkin Park; bowls' house in Victoria Park; bowls' house in Dyfatty Park; and bowls' house, kitchen and shelter in Llewelyn Park, for the Swansea Corporation. Deposit 2*l.* 2*s.* The Borough Estate Agent, 3 Prospect Place, Swansea.

WALES.—Dec. 6.—For erection of (*a*) fifty houses at Cwm Road, (*b*) fifty-three houses at Trewyddfa Common, Plasmarl, for the Swansea Corporation. Deposit 3*l.* 3*s.* The Borough Estate Agent, 3 Prospect Place, Swansea.

WARE.—Nov. 29.—For the following works at Stanstead pumping station, viz.:—Additions to engineer's cottage; (2) alterations to screening chamber of reservoir. Mr. H. Fox Hill, surveyor, Town Hall, Ware, Herts.

WASHWATER.—Dec. 5.—For the reconstruction of Washwater Bridge, near Newbury, consisting of a single brick arch of 21 feet span, for the Southampton County Council. Deposit 2*l.* 2*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

WELSHPOOL.—Dec. 8.—For erection of additions to the County schools, Welshpool. Deposit 1*l.* 1*s.* Messrs. Shayley & Ridge, architects, Oswestry and Welshpool.

WHETSTONE (MIDDLESEX).—Nov. 30.—For erection of Whetstone Sorting Office, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* Mr. J. Rutherford, 22 Carlisle Place, London, S.W.

WHEATLEY HILL (DURHAM).—Nov. 28.—For the erection of premises for the Sherburn Hill Co-operative Society, Ltd. Send names by Nov. 28 to Mr. J. Walton Taylor, F.R.I.B.A., St. John Street, Newcastle-upon-Tyne.

WOODFORD.—Nov. 29.—For the supply and erection of a corrugated iron cart shed. Mr. William Farrington, surveyor, Council Offices, Woodford Green, Essex.

TENDERS.

BRAINTREE (ESSEX).

For the erection of fourteen workmen's cottages, Skitts Hill, Braintree, for Messrs. Lake & Elliot, Ltd. Mr. J. RUSSELL ROGERS, P.A.S.I., architect, Maldon and Braintree.

Brown & Son	£3.084 0 0
Potter & Son	3.075 0 0
Dobson & Son	2.980 0 0
Smith & Son	2.625 0 0
Grimwood & Son	2.566 10 0
LETCH & BOWTELL, Braintree (*accepted*)	2.565 0 0

BRISTOL.

For the pulling down and re-building premises at 63 Castle Street. Messrs. T. SCAMMELL & SON, architects, Bristol and Wotton-under-Edge.

Cowlin	£4.600 0 0
Stephens & Bastow	4,597 0 0
Perkins & Son	4,498 0 0
Dowling & Son	4.487 0 0
Clark & Son	4,444 0 0
Walters & Son	4,437 0 0
Lovell & Son	4.359 0 0
Downs	4,250 0 0
HAYES (*provisionally accepted*)	4,149 0 0

DUNDRY.

For repairs and alterations to the Vicarage, Dundry, Somerset, under Queen Anne's Bounty Grant. Messrs. T. SCAMMELL & SON, architects, Bristol and Wotton-under-Edge.

WALKER & SON, Bristol (*accepted*)	£108 0 0

DORKING.

For carrying out the Trashurst sewer extension for the Rural District Council. Mr. W. RAPLEY, jun., surveyor.

Cummins & Sons	£280 17 4
Longhurst & Sons	227 13 5
Osenton	190 3 11
May & Son	178 5 0
Blaker	173 9 11
Lown & Co.	143 0 0
ARTHUR (*accepted*)	134 4 11

EARLSWOOD.

For additions to the administrative block of the Isolation Hospital, for the Reigate Rural District Council. Mr. T. W. PARRISH, architect, Horley.

Freeman	£466 12 0
Gorham	465 0 0
Worssell	398 10 0
Nightingale & Sons	394 0 0
Mitchell	365 0 0
LAKER, Horley (*accepted*)	286 15 0

HANDSWORTH.

For blue brick footpath paving in Booth Street, and granite carriageway paving in Downing Street, Handsworth, Staffs. Mr. H. RICHARDSON, A.M.I.C.E., surveyor.

Wood	£2,105 12 4
G. Trentham	1,970 19 7
Hunt & Son	1,952 18 5
Currall, Lewis & Martin	1,810 7 4
Harris & Son	1,800 9 5
G. P. Trentham	1,711 13 0
Thorpe	1,681 0 3
HARPER & SONS, Black Heath (*accepted*)	1,556 10 9

LONDON.

For kerbing, channelling, and making-up proposed road between the existing Temple Mills Bridge and the bridge now in course of construction over the Waterworks River, for the Hackney Borough Council.

Pedrette	£1,349 12 7
Adams	1,298 7 6
Catley	1,169 8 10
Bloomfield	1,152 4 11
Anderson	1,112 6 11
Griffiths & Co.	1,057 4 5
Porter	1,037 8 7
Coxhead, Leytonstone (*recommended*)	984 10 11

For the rebuilding of the Great College Street school (St. Pancras), providing accommodation for 360 boys, 360 girls, and 405 infants, for the London County Council.

		*	†
Allen & Sons	£22,660	£ —	£25
Johnson & Co.	22,328	100	35
Treasure & Son	22,295	289	22
Downs	22,043	—	—
Porter	21,732	198	15
McLaughlin & Harvey	21,372	160	16
Patman & Fotheringham	21,173	165	15
Lawrance & Sons	20,484	480	13
Ditto, amended (*recommended*)	18,696	—	—
Godson & Sons (*withdrawn*)	19,784	375	23
Architect's original estimate	20,010	—	—
Architect's amended estimate	18,220	—	—

* Extra for plain glazed tile dadoes instead of salt-glazed dadoes.

† Extra for special roof tiles instead of Broseley tiling.

MAIDSTONE.

For new classroom and other works at the Grammar School for Girls. Messrs. RUCK & SMITH, architects, Maidstone.

Sellick & Son	£2,470 18 0
Gray & Barney	2,148 0 0
Cox Bros.	2,090 0 0
Cruttenden & Son	2,085 0 0
Corben & Co.	2,050 0 0
Baker & Son	2,045 0 0
Elmore & Son	1,995 0 0
Burrows	1,986 0 0
Ellingham	1,967 0 0
Davison	1,964 0 0
Wallis & Sons	1,938 0 0
Seagar	1,879 0 0
Barden & Head, Maidstone (*recommended*)	1,860 0 0

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RICHMOND.

For sewerage works in the parish of North Sheen, Richmond, Surrey. Mr. WILLIAM FAIRLEY, engineer, 69 Victoria Street, Westminster, and Main Drainage Works, Kew Gardens.

Mowlem & Co.	£7,690 0 0
Pethick Bros.	6,836 0 0
Kavanagh & Co.	5,725 0 0
J. & T. Binns	5,537 8 4
Pedrette	4,850 0 0
MUIRHEAD & Co., Queen Victoria Street (*accepted*)	4,828 14 5

SCOTLAND.

For the erection of a police-station at Low Valleyfield, for the County Council of Fife. Mr. D. HENRY, architect, St. Andrews.

Accepted Tenders.

Wilson, mason and brickwork	£345 0 0
King, joiner	156 5 8
Thomson & Co., plumber	90 3 9
Robertson, slater	65 19 0
Smith, Sons & Co., cell doors, &c.	63 19 0
Lind Bros., plasterer	41 19 0
Keay, heating	33 9 0

THORNEY.

For erection of police station, cells, and police constables' cottages, for the Isle of Ely County Council.

Cracknell	£1,238 0 0
Heath	1,140 4 0
Rands & Son	1,100 0 0
H. & L. Cave	1,075 0 0
Gray	1,072 18 0
Elworthy & Co.	1,060 0 0
WILKINSON & SON, Elm (*accepted*)	950 0 0

TUNBRIDGE WELLS.

For the erection and completion of premises adjoining Groombridge Station. Mr. D. N. BAKE, surveyor, Tunbridge Wells.

Stanbridge & Son	£1,082 0 0
Bingham	902 6 6
Meades	832 15 8
Goodwin Bros.	827 15 0
Jarvis	774 12 6
Parker	750 0 0
Cheeseman	739 0 0
Manktelow	733 17 0
HOUSEGO, Groombridge (*accepted*)	728 0 0

WAKEFIELD.

For the erection of houses and shop at Agbrigg. Messrs. Richardson, Son & Bell, A.R.I.B.A., architects, Wakefield.

Accepted Tenders.

Nicholson, builder	£3,156 7 6
Lockwood & Sons, joiner	2,010 8 4
Gillott, plumber	576 2 6
Wilkinson, plasterer	480 17 10
Illingworth, slater	414 0 0
North, painter	104 18 11

WALES.

For erection of new buildings and alterations to the existing buildings at the Council school, Milford Haven. Mr. D. E. THOMAS, architect, Haverfordwest.

David	£4,949 6 6
Davies & Sons	4,731 0 0
Lloyd & Co.	4,634 6 8
Hayward & Wooster	4,600 0 0
Adams	4,368 3 0
Scott	4,343 0 0
Watkins	4,329 0 0
Cole & Sons	4,233 0 0
DAVIES & GRIFFITHS, Pembroke Dock (*accepted*)	3,704 0 0

For proposed servants' quarters, Howells, Glamorgan County Schools, Llandaff. Mr. G. E. HALLIDAY, F.R.I.B.A., Cardiff.

Stevens	£1,149 0 0
Evans	1,141 0 0
Shail	1,100 0 0
Hatherly & Co.	1,057 0 0
Davis & Sons	1,050 0 0
Turner & Sons	994 0 0
Cox & BARDO, Cardiff (*accepted*)	969 19 3
Moon	897 0 0
Bryan	836 2 9

WEST STANLEY.

For erection of club and institute, West Stanley, Durham. Mr. T. E. TAYLOR, architect, Lanchester.

Routledge	£3,675 0 0
Smith	3,653 0 0
Jobling	3,565 8 1
Sheriff & Sons	3,550 0 0
Rutter & Sons	3,451 9 0
Charlton & Sons	3,420 0 0
DUFFY, West Stanley (*accepted*)	3,298 0 0
White	3,269 0 0
George & Son	3,265 0 0

INCORPORATED SOCIETY FOR PROMOTING THE ENLARGEMENT, BUILDING AND REPAIRING OF CHURCHES AND CHAPELS.

THIS Society held its usual monthly meeting on the 17th inst., at the Society's House, 7 Dean's Yard, Westminsetr Abbey, S.W., the Rev. Canon C. F. Norman in the chair.

It was announced at this meeting that His Majesty the King had been graciously pleased to become Patron of the Society, a favour which was also accorded by the late King, Queen Victoria, and George IV.

Grants of money were made in aid of the following objects, viz.:—Building new churches at Ammanford, All Saints, Carm., 175*l.*; Gorseinon, St. Catherine, Glam., 250*l.*; Hove, St. Agnes, Sussex, 150*l.*, and Small Heath, The Good Shepherd, near Birmingham, 120*l.*; rebuilding the churches at Deptford, St. Nicholas, Kent, 250*l.*, and Starbeck, St. Andrew, Yorks, 100*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Cotleigh, St. Michael, Devon, 25*l.*; Gwytherin, St. Eleri and St. James, Denbighs., 20*l.*; Llanfwrog, St. Murog, Anglesey, 25*l.*; Longcott, St. Mary, Berks., 25*l.*; St. Mary-in-the-Marsh, Kent, 50*l.*; Tarrant Crawford, St. Mary, Dorset, 50*l.*; Chesham Bois, St. Leonard, Bucks., 70*l.*; Gaywood, St. Faith, Norfolk, 120*l.*; and Llanfihangel-uwch-Gwili, St. Michael, Carm., 30*l.* Grants were also made from the Special Mission Buildings Fund towards building Mission Churches at Milford Haven, St. Peter, Pembs., 20*l.*; and Penrhiwceiber, St. Winifred, Glam., 30*l.* The following grants were also paid for works completed:—Stocklinch Ottersay, St. Mary, Som., 15*l.*; Crynant, St. Margaret, Glam., 100*l.*; Ilford, St. Alban, 100*l.* (being balance of a grant of 1,000*l.*); Twyford, St. Mary, Berks., 60*l.*; South Shields, St. Oswin, Co. Durham, 100*l.*; Tilsworth, All Saints, Beds., 25*l.*; Whittlesford, St. Mary and St. Andrew, near Cambridge, 20*l.*; Barfreystone, St. Mary-the-Virgin, near Dover, 10*l.*; Ashbury, St. Mary, Berks., 40*l.*; Caerau, St. Cynfelyn, Glam., 150*l.*; Lower Mitton, St. Michael, Worcs., 75*l.*; Leeds, St. Margaret, 210*l.*; Skenfrith, St. Bridget, Monmouth, 25*l.*; New Charlton, The Good Shepherd, Kent, 25*l.*; Catcliffe, St. Faith, near Rotherham, 40*l.*; Burnham-on-Crouch, Essex, 15*l.*; Walthamstow, St. Oswald, Essex, 50*l.*; Penparke, Aberystwyth, 25*l.*; and Scackleton, York, 20*l.* In addition to this the sum of 935*l.* was paid towards the repairs of forty-one churches from trust funds held by the Society.

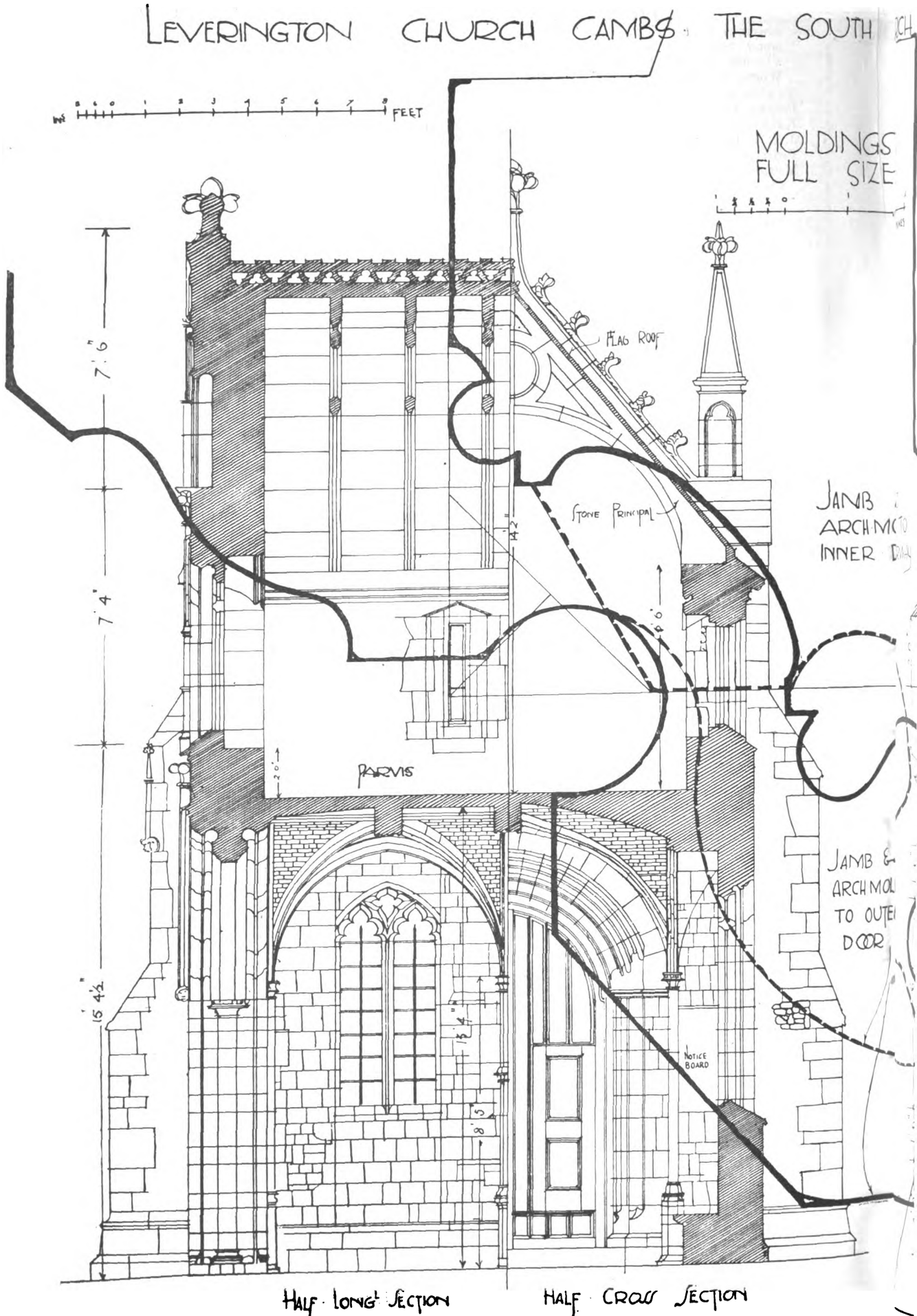
The grants made at this meeting bring the amount voted during the present year to a total of 8,500*l.* The Committee are anxious to increase rather than decrease the number and amount of the grants, but this will only be possible if more liberal support is rendered to the Society, which is entirely dependent upon voluntary contributions. Subscribers to its funds have the satisfaction of feeling assured that, owing to the Society's high standard of architectural requirements, the funds administered by it are spent to the very best advantage.

LEVERINGTON CHURCH, CAMBS.—THE SOUTH PORCH.

THIS porch is a good and interesting example of fourteenth-century work. Up to 1888, when it was restored by the late Mr. Pearson, it was in a very dilapidated condition. It was almost entirely covered with plaster, which when stripped from the vaulting showed the filling in to be of brick, which was replaced by stone. The tracery of the window in the parvis, which had been removed, was replaced. The pierced ridge is original and an interesting example. The whole porch forms a very interesting study, the detail being very good. The church is of the typical parish church plan with a fine western tower.

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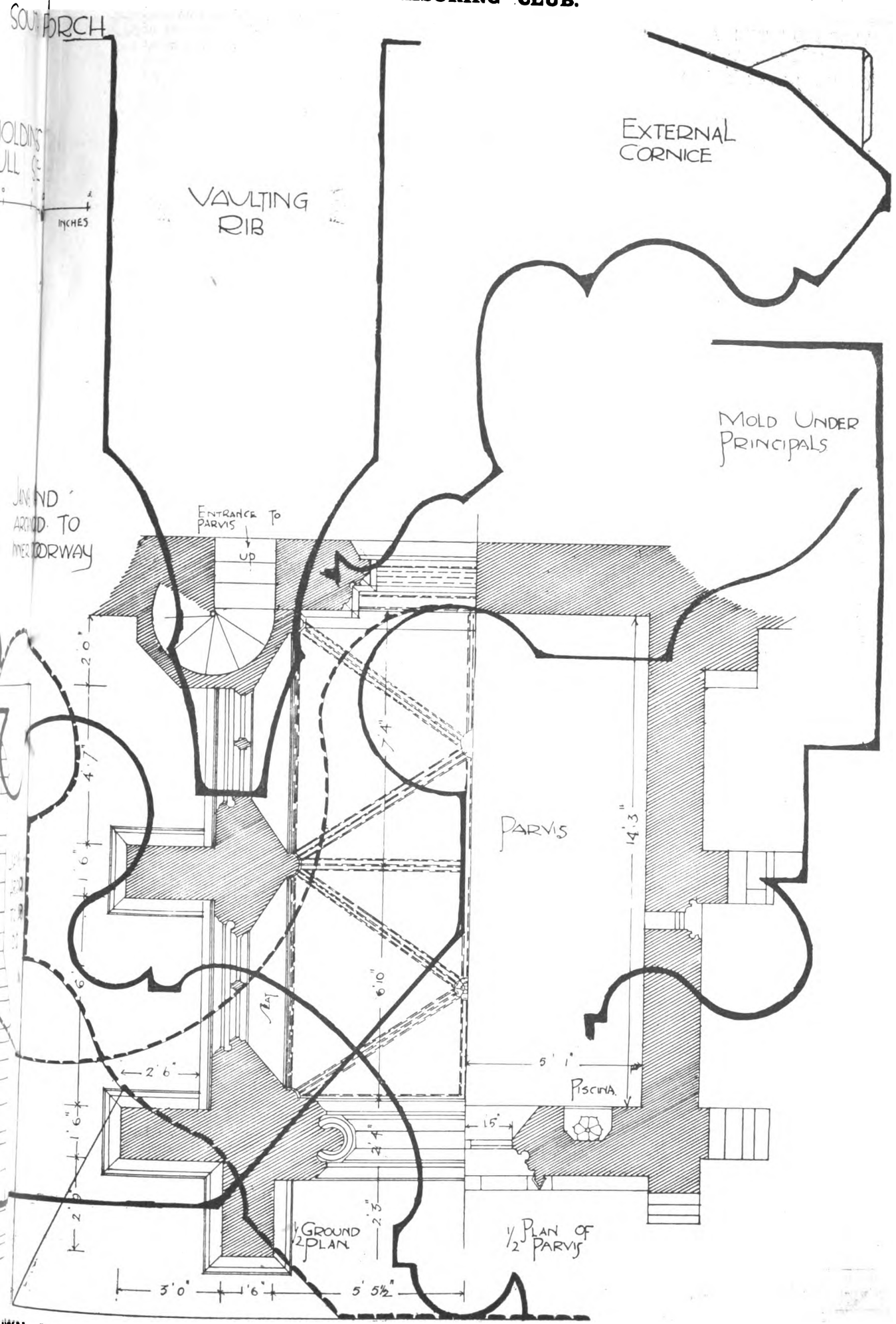
LEVERINGTON CHURCH CAMBS. THE SOUTH PORCH



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THE PROBLEM OF THE ARCHITECT'S ASSISTANT.*

(Continued from last week.)

Such a register as would meet the needs of the profession would require to be conducted with care and attention, and would entail a considerable amount of active work on the part of those undertaking it; but it would be very well worth the time and labour spent on it.

Such a register, moreover, would provide the means of obtaining for us exact information as to the actual state of affairs in the profession, such as does not exist at the present moment, and would, I think, if in existence at present, reveal a state of things that would induce even those fine spirits who have a tendency to ignore mere material needs to admit that some action in the matter is not called for before it is wanted.

Associated with this is the question of unemployed insurance. Here, again, the exact information at present available on the subject of unemployment is too meagre to enable anyone to formulate such a scheme, and in this case again there is none concerned in obtaining the necessary information. The assistant must do the work for himself. the problem is his, and he must solve it. Such a system would be the means of tiding many a man over several hard and anxious months in his search for work, instead of leaving him, as at present, at the mercy of the first job offered to him in an overcrowded and underpaid market. This is more especially the case with the older and more experienced assistant, who, when out of work, finds it ever more and more difficult to get in again at his former salary, and who has often to choose between accepting the salary of a junior or starving. In fact, once started on this downward grade it would seem to be only a matter of time as to his eventual arrival at the workhouse, if only he has the misfortune to live long enough. It would, perhaps, be inquiring too curiously to obtain a knowledge of what really does become of the superfluous assistant, through what stages of decay and despair he passes, to what final solution he arrives. We have all of us come across him at times tramping drearily up and down the office stairs with his little roll which he so seldom gets a chance to untie. Being neither an aggressive nor pertinacious person, he is easily dismissed and soon forgotten, but his existence is a warning to all of us that these questions of unemployed insurance and registration are not to be lightly dismissed as matters of little consequence.

Apart from these external causes there are, as I have said, other internal causes at work, limiting the outlook not only of the assistant, but of the whole profession, and among these not the least, in my opinion, is that childish piece of make-belief on the part of the profession at large that the architect is only to be regarded as an artist, and not at all as a man of business. Now, whether as an artist or as a man of business, his position is governed by that economic factor which is always at work, and which at some point or other enters into the consideration of even the most abstract questions, and I think that hitherto this factor has been to a great extent ignored in considering the practise of the art of architecture.

How is it that many large commercial combinations have been able to take a substantial and increasing amount of work from the profession? Simply by looking at the matter from an economic standpoint, which we have never made a practice of doing. As a result we have never yet succeeded in justifying our existence to the general public as an economic necessity, but, on the contrary, have sedulously imbued them with the idea that we are an expensive luxury. This, in our case, is a great mistake, for it has been truly said that the English are a nation of shopkeepers. Had we been living on the other side of the English Channel our artistic posing might have been understood and appreciated.

Now the architect in the practise of his art is called upon to deal with many matters not merely of interest, but of vital importance to his client. He is responsible not only for the architecture, but for the efficient construction, sanitation, protection from fire and from natural decay of the buildings he designs. He has inevitably in his hands the material and commercial interests of his clients in a hundred different directions, but he has contrived to convey a general impression that he only cares for these things with his left hand. He has ignored his plain economic value to exalt his artistic value, with the natural result among a business community that a large amount of work has been lost to him, people preferring to employ what they call a "practical man." Even in those cases where the public feel it necessary to employ the services of an architect they do so largely with the idea that he will act as a means of defence against the contractor by tying that gentleman down to a definite contract and seeing that he carries it out, and their choice of any particular architect for this purpose is very rarely governed by any regard to his artistic qualifications; on the contrary, they would probably regard any pronounced artistic qualities with considerable distrust. And, indeed, having regard to some of their experiences in the matter, I think we must admit that their distrust is not without some reasonable grounds.

When we consider the enormous amount of responsibility which an architect takes on his shoulders in carrying out a commission, the variety of functions which he undertakes to perform, and the numerous details over which his authority extends, it is perhaps not surprising that he seems to be constantly endeavouring to shuffle on to somebody else as much of it as he possibly can. The quantity surveyor, the constructional engineer, the sanitary and other specialists have all arisen to supply the deficiencies of the architect. If any man needs an encyclopædic knowledge and firm business grasp for the performance of his duties, it is the architect; but the popular idea of him is that he is merely a man who can draw, and this idea, as I have said, has been largely fostered by the architect himself. He begins by inculcating the idea into his pupils and impressing it upon all his assistants as the one vital quality by which he must be judged, this ability to draw nicely; whereas we all know very well that fine draughtsmanship is not only not necessary for success in the business of an architect, but that it is not even necessary for the production of fine architecture. It is only a means to an end with us, and, though a highly desirable acquirement, is still only a subordinate one, and they who cultivate no other can never hold anything but a subordinate position in the profession.

It is the attainment of an enhanced economic value which is the main object of the ardent registrationist, and he proposes to attain this object by simply compelling the general public to employ him. I am personally somewhat doubtful of the efficacy of registration alone to achieve this desired result. At least it will be necessary, first of all, to convince the general public that the result is a desirable one for them, and, secondly, the undeniable fact that architecture is an art lays any scheme for restricting it open to objections. But I feel no doubt at all that much can be immediately done by a combination of the existing forces within the profession, determined on carrying out a united policy, and in the formation of this policy the assistant should take care that his interests are included.

But at the present moment, while the principal has begun to wake up to the urgency of the situation as regards his own practical interests, the assistant is still following the same old route, saying "It is well; it is well." While the high priests are thinking of pounds, shillings and pence and the improvement of the collection, the acolytes of the profession are studiously attending the seven lamps of the temple of architecture, without thinking of the final result of their apprenticeship. At least, if they do think anything they keep their thoughts very much to themselves, or mutter them with bated breath to their fellows, lest the goddess of the temple should think they were slighting her divinity and destroy them.

Yet, notwithstanding all the talk about architecture as an art, there is no getting away from the fact that the architect practises his art for his own material advantage, and that most of the best architecture—at least in modern times—has been produced by the professional architect working with this object; while, on the other hand, we have several notable examples of what to expect from the amateur architect who practises architecture for the mere love of the thing. Also it should not be forgotten that architecture is not an end in itself, that every building has in its initial conception a practical purpose to serve independent of the art of architecture, and the truest artist is he who never loses sight of this purpose. The vagaries of architectural fashion produce at times some very ridiculous results, which are not to the credit of either the artistic or practical good sense of the profession; and the architect cannot, like some more fortunate men, hide his mistakes. His bad buildings stand as a perpetual reproach to him, an eyesore to the public, who cannot get away from them, and a constant annoyance to the people who have to use them. The capable

* A paper read by Mr. J. V. Hibbert, F.S.I., at a meeting of the Guild of Architects' Assistants, on November 8.

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architect's assistant claims, like his chief, to be an artist and a qualified professional man. He is ready to accept every available opportunity to match himself against all comers in proof of his ability, and I need only point to the results of several recent and important public competitions as evidence that he has proved himself to be a person of some consideration.

(To be concluded.)

ELECTRIC SIGNS.

One of the very latest arrivals in the field of illuminated advertising is the Venner patent sign. This invention has been patented in every country throughout the world; and the patentees have now set up a large factory for the manufacture of the signs. An illustrated pamphlet entitled "Signs of the Times," showing several of them already in use, has been produced by Messrs. Harris & Sheldon, Ltd., shop-front builders and fitters of Birmingham, who are acting as agents. The first shown is the bold sign over the entrance to the Coliseum. This must have escaped the notice of but few people who have ever been in the neighbourhood of Trafalgar Square. Another insistent Venner sign in the Metropolis is on the four storeys over Eltham's Cigar Stores opposite the Oxford Music Hall. There are illustrated other signs, both great and small. One of the latter is given herewith as suggesting neatness as well as effectiveness. The Venner sign is over the 1,000*l.* case which was at the recent Japanese Exhibition. The problem before the patentees when they set to work was to produce a sign which would look as well by day as an ordinary incised and gilded facia, and which at the same time would be brilliant and attractive at night. After many experiments on the old types of illuminated signs the present Venner sign was arrived at, and instantly achieved success. It is calculated that the sign gives at one-tenth the cost of current as much advertising value as an ordinary sign. The success is due also to the scientific manner in dealing with the light by means of condensers as well as to the small cost of current.

BRUSSELS EXHIBITION.

Splendid business is reported to have been done by exhibitors in the British section of the Brussels Exhibition. There are numerous cases which might be quoted, but one of the most striking examples in the buildings, decoration and furniture section is provided by the head of a leading London firm, who declares he cannot get a sufficient number of designers to keep pace with the orders coming in as the result of his display in Brussels. Another firm in the same line has done business amounting to 100*l.* per day. It is also stated that the English furnishing trade is now getting an immense proportion of the furnishing business of the world. Foreigners are realising more and more that what comes from British makers is comfortable, and at the same time practical and elegant. The conclusion come to on the Continent, according to a reliable authority, is that the British furniture section showed a much higher standard of excellence than the furniture sections in any of the other foreign pavilions.

As regards British pottery, it has become famous among the world's greatest connoisseurs and thousands of pounds worth have been sold.

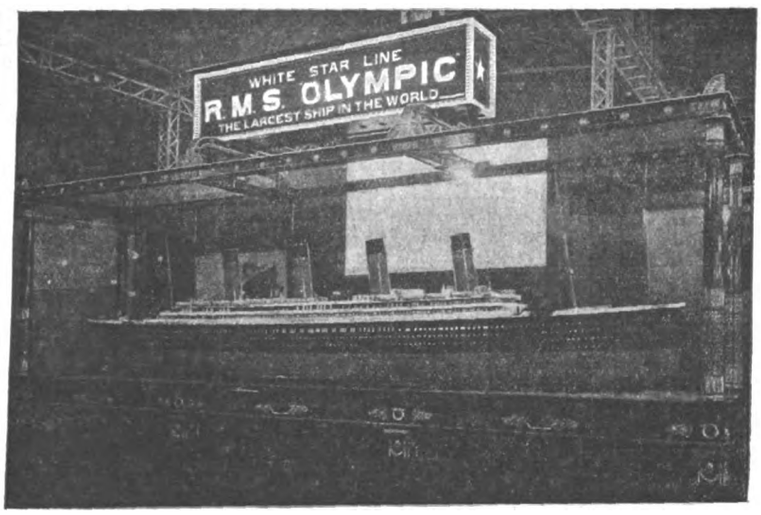
On the buildings, decoration and furniture committee directly responsible for this section are Mr. C. C. Allom (chairman), Mr. W. H. Romaine-Walker (vice-chairman), Mr. A. Barnard Cowtan Mr. John H. Gill, Mr. H. P. E. Harding, Mr. Thomas C. Moore, Dr. Louis C. Parkes, Mr. G. W. Partridge, Mr. F. Litchfield, Mr. H. D. Searles-Wood, F.R.I.B.A., Sir Horace Regnart, Mr. E. White Wallis, Mr. S. J. Waring, and Mr. Frank Warner. For Turin these gentlemen are arranging a still more remarkable show than the one in Brussels. Not only furniture, but all the accessories which go to perfect an English living room and which are so much sought after by foreign hotel proprietors, are to be shown.

TRADE NOTES.

Messrs. Priestman Bros., Ltd., have been awarded the "Grand Prix" at the Buenos Aires Exhibition for their Grab-Dredger, Excavator and Elevator.

One of the largest single orders placed with a gas stove firm for an installation of cooking apparatus has been received by the Richmond Gas Stove and Meter Company, Ltd. The apparatus has been placed by His Majesty's Office of Works for the new Money Order Office, and we learn the total value of the order is approximately 1,750*l.*

The Ratner Safe Co. have received an order from the Admiralty for 69 improved cash safes with specially designed locking arrangements for H.M. battleships. They are secured by two locks, one the ordinary Ratner lever safe lock, and the other a figure combination lock, arranged that when the safe is locked the key cannot be removed until the bolt of the combination lock has been shot. By this means both locks must be locked at the same time. The fittings consist of traps grooved to take the various coins used in the British Empire.



The Cargo Fleet Iron Co., Ltd., of Middlesbrough, have issued their balance-sheet, from which it will be seen that the profit for the year amounts to 32,270*l.* 12*s.* 11*d.* The directors are to be congratulated on such a result considering the loss made the year previously.

A sand fire-extinguishing equipment, which should prove very useful in motor garages, has been recently introduced by Messrs. Merryweather & Sons, of Greenwich. It comprises a three-wheeled steel sand truck, holding about 6 cwt. of sand. The sand can be taken from the top, or it can be shovelled into a bucket from the side. A fibre bucket is carried on a bracket at the back, and two strong wooden spades are supported on iron brackets at the side. In another form, the sand-bin is of larger capacity (holding about 8 cwt. of sand), and is mounted on legs instead of wheels.

The Flintshire County Council recently gave permission to the Rev. Stephen Gladstone, M.A., to place a clock on the outside of Hawarden Town Hall. Messrs. Wm. Potts & Sons, Ltd., clock manufacturers, Leeds and Newcastle, are now making the above clock. Messrs. Wm. Potts & Sons are also erecting a memorial jubilee clock and chimes at the parish church, Carnforth, Lancashire; and commemoration clocks for Bingley and Stainland, West Yorkshire; and Sledmere, East Yorkshire, for Sir Tatton Sykes, Bart.; also a large bell for above.

The Electric Wiring Bill is being prepared by the Incorporated Municipal Electrical Association for the next Parliamentary session, which is intended to confer upon local authorities owning electric supply powers the statutory right to engage in the wiring of premises for electric light, and in the sale of electrical apparatus and fittings. The main opposition to the Bill comes from the Electrical Contractors' Association, who contend that the scheme will constitute unfair and unnecessary rate-aided competition with an established branch of retail trade.

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INTERNATIONAL CORRESPONDENCE SCHOOLS.

One of the good things which have come to our shores from America is the elaborately organised correspondence schools. They may, however, be more fitly described as universities, for the ground they cover is as wide as knowledge itself. The headquarters in the United Kingdom of these ever-flowing fountains is at International Buildings, Kingsway, London, W.C. Here an opportunity was given last week for a general public inspection of the system followed by the International Correspondence Schools, Ltd. The popularity of the classes has grown enormously during the past five years, as is evidenced by the fact that in the past ten months 141,471 students' examination papers were corrected as against 2,465 in 1906. There are now more than 180 courses of instruction, which includes a complete architectural course with its numerous sub-courses for all who wish to specialise. The prospective architectural student may either enrol in the complete architectural course, taking the drawing section first, or he may enrol in the architectural drawing and designing course first, and afterwards take the complete architectural course at a reduced fee. The entire work is done by post, and it covers the Syllabus of Examinations of the R.I.B.A., the Society of Architects, and the Board of Education.

VARIETIES.

Mr. Geo. A. Akers (of Messrs. George A. Akers & Co., 98 High Holborn, W.C.), has been elected a member of the Institution of Heating and Ventilating Engineers.

The Kent County Council last week adopted the plans prepared by Mr. F. W. Ruck, county architect, for new county offices to be erected at Maidstone at an estimated inclusive cost of 50,000*l.*

The Morecambe Town Council are going to proceed at once with a scheme for extending the Promenade from the Central Pier to the end of Green Street, at an estimated cost of 2,000*l.* The average width of the extension will be 65 feet for a length of 270 feet.

The Thames Conservancy have adopted a scheme for the reconstruction of Boulter's Lock, and the provision of a mechanical conveyor. The cost is estimated at 12,150*l.* if water power is used, and 11,120*l.* if electrical power is used for the mechanical boat conveyor.

The Ormesby Urban Council last week considered an offer from a Middlesbrough architect to prepare a town-planning scheme for North Ormesby at a cost of 100*l.* The Clerk was finally instructed to reply that the Council were not in a position to accept the offer.

The West Riding education committee on Tuesday adopted recommendations for the erection of schools at Bingley (900*l.*), Gisburn (1,200*l.*), Horbury (6,600*l.*), and Stanley (3,000*l.*). Sites for new elementary schools are to be purchased at Balby Skelmanthorpe, South Elmsall, and Thurnscoe.

Additions and alterations have been carried out at Bethesda Free Church, Victoria Road, South Shields, including new entrance porch and gallery to the church, and the rebuilding of the Sunday school. Messrs. Wm. Wilson & Sons of Brunswick Street, South Shields, were the contractors, and Henry Grieves, A.R.I.B.A., Albany Chambers, South Shields, the architect.

The Grimsby Corporation Estates committee last week considered an offer from Messrs. T. G. Tickler, fruit preservers, for a seventy-five years' lease of a large plot of land adjoining the Corporation Electricity Works at 3*d.* per yard per annum. The firm stated that they intended to build a model factory for the manufacture of preserves, which would employ 500 hands. After a long discussion it was agreed to offer Messrs. Tickler the site at 4*d.* per yard.

The Kent County Council have agreed that loans be obtained as follows:—1,764*l.*, erection and equipment of a school at Cudham; 710*l.*, purchase of a site for a school at Dartford; 25*l.*, improvement at East Peckham school; 3,425*l.*, erection and equipment of a school at Garlinge; 160*l.*, improvements at Hawkinge school; 154*l.*, improvements at Hoo St. Werburgh school; 5,010*l.*, purchase of a site, erection and equipment of a school at Loose.

The Warrington Education Committee at their monthly meeting decided that a plot of land in King Edward Street, containing about 3¾ acres, at a cost of 725*l.* per acre, be purchased for the erection of an elementary school providing for 420 boys, 420 girls, and 420 infants, together with a cookery centre, handicraft centre, douche baths, and caretaker's house.

The Durham County Education Committee have secured a site of about eleven acres at Neville's Cross, near Durham city, for a Training College, to accommodate 120 women students. The residential buildings will be erected in three separate blocks. Other buildings will include the educational rooms, gymnasium, sanatorium, laundry, &c. Sketch plans, prepared by the County Education Architect, have been submitted to the Board of Education, and, with slight modifications, have been approved by them.

Bellshill Baptist Church, N.B., was opened on Saturday last. The buildings occupy a prominent site at the corner of Neilson Street and Motherwell Road, and consist of church, vestry, ladies' and gentlemen's retiring rooms, lavatories, and heating chamber. The walls are of red sandstone, and roofs are slated with green slates and red tile ridging. The church is seated for 550 persons, has open timber roof, and the windows are filled with leaded glass. The architects are Messrs. Miller & Black, F.R.I.B.A., I.A., 58 Renfield Street, Glasgow.

The Edinburgh School Board on Monday adopted plans on the recommendation of the building committee for the erection of a new school at Viewforth (in the place of Gillespie's school) and a supplementary school at Tynecastle. Both schools are to be built on the one class-room thick system. Viewforth school is to be a higher grade school, to accommodate 1,200—if necessary 1,800—and would cost 55,000*l.*; and Tynecastle school is to accommodate 1,000 pupils, and cost 18,000*l.*

The Lancashire Education Committee on Monday passed a resolution protesting against the re-assessment by the Board of Education of school premises, through which their accommodation had been reduced by 26,292 places. The Chairman mentioned in the course of the discussion that the Elementary Education Sub-committee were having a conference with respect to the type of school buildings to be erected in the county. It appeared that the Board of Education were now objecting to schools of the central-hall type, and as the Education Committee were desirous of building two new schools of that type, they had had to delay, for the Board of Education did not approve of the plans.

Mr. P. C. Cowan, M.I.C.E., held a Board of Trade inquiry in the City Hall, Belfast, last week, into the application of the Belfast Corporation for a loan of 85,000*l.* for the purpose of constructing sewerage works for the city, and 10,000*l.* for purchasing ground at Short Strand. The total cost of the works really involved is 101,000*l.*, but 16,000*l.* has been already expended, which sum was taken out of a sum of 40,000*l.* formerly sanctioned by the Local Government Board. The scheme now proposed was to convey the entire sewage of the city on both sides of the River Lagan to the outfall works on the Antrim Coast. At present the greater part of the sewage of County Down from the Sydenham district was discharged on the beach at Sydenham.

The Glasgow Corporation have agreed, in connection with the proposal to complete the decoration of the Banqueting Hall in the Municipal Buildings, that Mr. William Finlay, one of the six selected artists named in Mr. Leiper's report, be asked to prepare a completed specimen of one of the four panels above the doorways at the west end of the hall. The fee for this panel is to be fixed and paid to Mr. Finlay after the panel has been accepted by the Corporation. Mr. Leiper, R.S.A., has been instructed to further report on the sketches submitted by Messrs. D. F. Wilson, A. Law and A. M'Lellan (being other three of the six selected artists named in Mr. Leiper's report). The sketches sent in by the seven other artists named in Mr. Leiper's report are to be returned to them, along with an honorarium of 10*l.* 10*s.* to each.

The new church of St. Mark's, Purley, was consecrated by the Bishop of Southwark on November 19. The church, which is designed in the Decorated style, freely treated, stands on nearly the highest part of Peakes Hill, and consists of a nave 85 feet long by 25 feet 6 inches broad, and 38 feet high to the underside of the barrel roof, divided into five bays with north and south aisles, and double transepts. A baptistery is formed at the west end, with porches on either side, and a tower and spire (not yet completed) is placed on the north side. A chancel arch divides the nave from the chancel, which is 38 feet 6 inches long by 24 feet 6 inches wide, the roof being continued throughout at the same height as the nave. An apsidal-ended chapel is placed on the north side, and vestries and organ chamber on the south side of the chancel. The whole church and fittings have been carried out from the designs of Mr. George H. Fellowes Prynne, F.R.I.B.A., of Westminster, by Messrs. H. Wilkins & Sons, of Bristol, at a cost of about 9,000*l.*

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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

Special Position Spaces.—Unless ordered for weekly insertions the Proprietors cannot guarantee particular dates.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

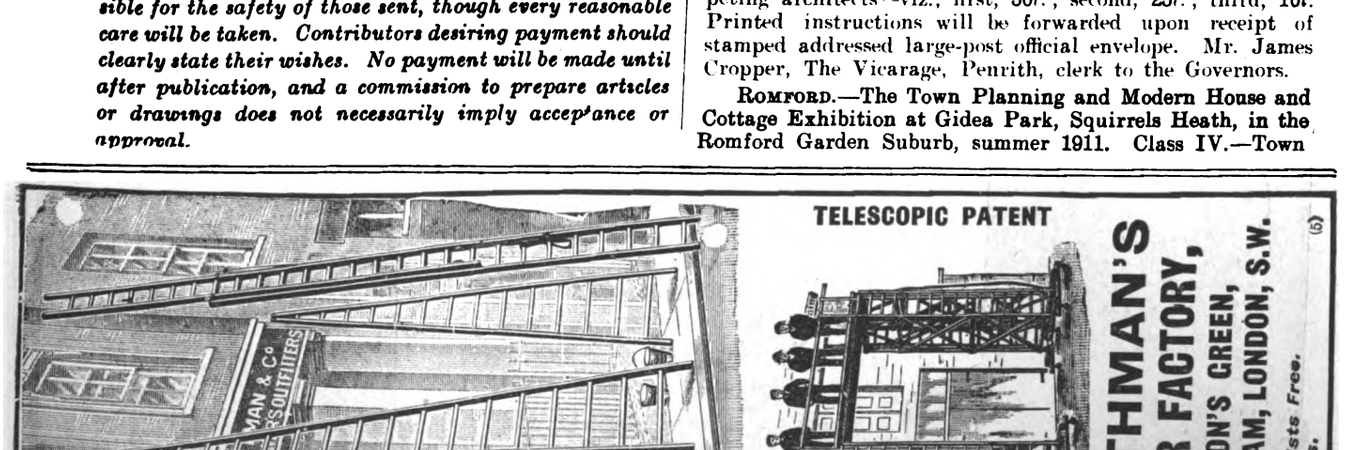
COVENTRY.—March 1.—The Corporation contemplate the erection of municipal offices in the centre of the city, and also possibly a town hall, and accordingly invite competitive designs. Mr. E. Guy Dawber, F.R.I.B.A., will act as assessor. Deposit 2*l.* 2*s.*, which will be refunded on receipt of a bona-fide design or if the particulars are returned within fourteen days of receipt. Mr. Geo. Sutton, town clerk, 10 Hay Lane, Coventry. (For further particulars see advertisement, November 18.)

CUBA.—April 15.—An international competition has been arranged for a Presidential Palace to be erected at Havana at a cost of about 205,000*l.* Premiums of 10,000 pesos and 5,000 pesos will be awarded. Conditions may be seen at the Cuban Legation, 3 Grosvenor Mansions, Victoria Street, S.W., or the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C.

ISLE OF MAN.—Dec. 14.—The owners of the Villa Marina, Douglas, invite designs for pavilion and laying out pleasure gardens, &c., at a cost of 16,000*l.* One award of 200*l.* and two of 100*l.* will be made, the design becoming the absolute property of the landowners. Send 1*l.* 1*s.* deposit to Mr. Alexander Robertson, Town Clerk, Town Hall, Douglas.

PENRITH.—Feb. 8.—The Governors of Queen Elizabeth's Grammar School, Penrith, are prepared to receive competitive designs for the erection of a secondary school, accommodating 200 students, with provision for the conduct of technical and evening classes. Premiums are offered to competing architects—viz., first, 50*l.*; second, 25*l.*; third, 10*l.* Printed instructions will be forwarded upon receipt of stamped addressed large-post official envelope. Mr. James Cropper, The Vicarage, Penrith, clerk to the Governors.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Class IV.—Town



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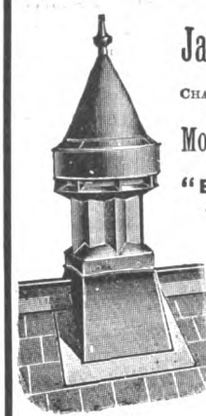
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plan of Gidea Park prizes of 100*l.* and 50*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs; Class IV., March 31, 1911. Mr. Michael Bunney, A.R.I.B.A., hon secretary, 33 Henrietta Street, Strand, W.C.

SOUTHPORT.—The Corporation invite architects practising in Southport to submit designs for a new public elementary school at Churchtown. Premiums of 50*l.*, 25*l.*, and 15*l.* will be paid to the authors of the first, second, and third successful designs. Full particulars, &c., may be obtained from Mr. J. Ernest Jarratt, town clerk, Town Hall, Southport.

TAUNTON.—Jan. 21.—The education committee invite architects, practising in the Borough of Taunton, to submit competitive designs for a provided school for 440 children. A block plan of site, together with conditions and instructions, may be obtained on application. No premium is offered, but the author of the selected design will have the carrying out of the work at 5*l.* per cent. Mr. George H. Kite, town clerk and clerk to the borough education committee, Municipal Buildings, Taunton.

WALES.—The Directors of the Oakdale Navigation Collies, Ltd., Tredegar, Mon., offer a prize of 100 guineas for the best set of plans for the building of a model village. Mr. A. S. Tallis, general manager, Oakdale Navigation Collieries, Ltd.; Tredegar, Mon.

CONTRACTS OPEN.

ASHBURTON.—Dec. 3.—For pulling down and re-building house and shop, North Street. Mr. H. V. Foot, Biala, Ashburton, Devon.

BACKBARROW.—Dec. 6.—For the whole or separate works required in erection of eight cottages, in two blocks of four each, for Backbarrow Co-operative Society. The Society's Stores, Backbarrow, Lancs.

BARNET.—Dec. 5.—For erection of twenty-nine cottages in Mays Lane, for the Urban District Council. Deposit 1*l.* 1*s.* Mr. W. F. Wilkins, surveyor to the Council, 40 High Street, Barnet.

BIRMINGHAM.—Dec. 12.—For the enlargement of Smethwick Branch Post Office. Deposit 1*l.* 1*s.* The Postmaster at Smethwick Branch Post Office; H.M. Office of Works, Storey's Gate, London, S.W.

BRADFORD.—Dec. 6.—For alterations to warehouses Nos. 29 and 31 St. James's Market. The City Architect, Town Hall, Bradford.

BRIGHTON.—Dec. 13.—For the rebuilding of No. 7 Gloucester Place. The Borough Surveyor, Town Hall, Brighton.

BRISTOL.—Dec. 7.—For the construction and maintenance for twelve months after completion of additional transit sheds at the Royal Edward Dock, Avonmouth, for the docks committee. The contract includes timber piling, concrete foundations, timber floors, steel stanchions, roof principals, and galvanised corrugated iron covering. Mr. W. W. Squire, engineer, Cumberland Road, Bristol. Send a deposit of 5*l.* to the Secretary of the Docks Committee, Dock Office, 19 Queen Square, Bristol.

BUXTON.—Dec. 10.—For proposed alterations to Old Wye House, for the Derbyshire education committee. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

CHARLES.—Dec. 10.—For erection of a house and offices for the Baptist Church, at Brayford, in the parish of Charles, North Devon. Mr. Thomas Carnell, architect, The Manse, Brayford.

CHELMSFORD.—Dec. 12.—For converting an existing room at the workhouse, Wood Street, into a padded room and an attendant's room, divided by a partition. Mr. Arthur S. Duffield, clerk, 96 High Street, Chelmsford.

CHORLEY (LANCS.).—Dec. 21.—For supply and fixing of steel girders, iron columns, rails, switches, hoists and other ironwork required for the alterations at the public slaughter-houses, for the Chorley Corporation. The Borough Surveyor's Office, Town Hall.

DURHAM.—Dec. 13.—The Durham County Council invite sole tenders (1) for erection of a school at Trimdon Colliery for about 500 children (Mr. W. Rushworth, Shire Hall, Durham); (2) for alterations, &c., at Crook (Mr. N. Richley, Shire Hall, Durham).

FITZ MILL.—Dec. 9.—For re-building the bridge at Fitz Mill, near Shrewsbury. The Atcham Rural District Council. Mr. E. P. Everest, clerk, Council Offices, St. John's Hill, Shrewsbury.

HALIFAX.—Dec. 5.—For the various works required in erecting doctor's residence, with motor house, &c., on the West Royd Estate, Kingcross. Messrs. Medley Hall & Son, architects, &c., 1 Harrison Road, Halifax.

LEEDS.—Dec. 8.—For extension of St. Augustine's School, Harehills. Mr. W. H. Herbert Marten, architect, 3 Cookridge Street, Leeds.

LONDON.—Dec. 6.—For the supply and erection of oak entrance gates at Victoria Park, E., for the London County Council. The Parks Department, 11 Regent Street, S.W.

LONDON.—Dec. 7.—For alterations and additions to the steward's office at the Northern (Convalescent) Fever Hospital, Winchmore Hill, for the Metropolitan Asylums Board. Deposit 1*l.* Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, the Office of the Board, Embankment, E.C.

LONDON.—Dec. 9.—For erection of fifty cottages on Mitcham Lane Estate, S.W. Messrs. Bignold & Idle, 242 Lavender Hill, S.W.

LONDON.—Dec. 12.—For repairs and painters' work to the exterior of the Whitfield Street Baths, for the St. Pancras Borough Council. Mr. C. H. F. Barrett, town clerk, Town Hall, Pancras Road, N.W.

LONDON.—Dec. 13.—For the erection of platform coverings at Paddington Goods Station, for the Great Western Railway Company. The Engineer, Paddington Station, W.

LONDON.—Dec. 19.—For supply and erection of about 307 yards lineal of cleft pale fencing, 6 feet high, complete, to be erected along the southern and western boundaries of Queen's Wood, Highgate. Mr. E. J. Lovegrove, borough engineer and surveyor, Municipal Offices, Highgate, N.

LOUGHBOROUGH.—Dec. 5.—For the following works in connection with the laying-out of the Great Central Road recreation ground, for the Estates Committee:—(1) Providing and erecting wrought-iron boundary fencing, with entrance gates, &c.; (2) shelter, conveniences and drainage to same; (3) floating off turf, levelling and re-turfing of a portion of the site, &c. Mr. A. H. Walker, A.M.I.C.E., borough surveyor, Town Hall, Loughborough, Leics.

LYMM.—Dec. 5.—For alterations and additions to Lymm Grammar School, Cheshire. Deposit 1*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

MAIDENHEAD.—Dec. 12.—For alterations and repairs at the Council Infants' School, King Street. The Office of the Borough Surveyor, Guildhall, Maidenhead.

MORLEY.—Dec. 5.—For the various works required in the extension of mill premises, Parkfield Mills, Morley, Yorks. Mr. T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, and 1 Basinghall Square, Leeds.

MULLION COVE.—Dec. 10.—For proposed additions and alterations to the Mullion Cove Hotel, Cornwall. Mr. Sampson Hill, architect, Green Lane, Redruth.

NEWBOTTLE.—Dec. 17.—For taking down and rebuilding part of the present buildings of the Newbottle and District Co-operative Society, Ltd. The Secretary of the Society, Back Lane, Newbottle, Northumberland.

PLYMOUTH.—Dec. 13.—For erection of stables, cart sheds, smithy and dwelling-house at Prince Rock. Deposit 2*l.* Mr. James Paton, borough engineer and surveyor, Municipal Offices, Plymouth.

PORTSMOUTH.—For executing repairs, &c., for the maintenance of Admiralty buildings, &c., at the R.N. College, Osborne, and Kingston, for a period of three years. Superintending Civil Engineer, Portsmouth Dockyard.

RAWTENSTALL.—Dec. 13.—For the extensions and alterations required at the municipal offices and tramway depôt, Bacup Road, Rawtenstall, Lancs. Deposit 2*l.* 2*s.* Mr. James Johnson, borough surveyor, Rawtenstall.

REPTON.—Dec. 3.—The Governors of Sir John Port's Charity invite tenders for the erection of class-rooms at Repton Shool. Deposit 1*l.* 1*s.* Builders in South Derbyshire and East Staffordshire should apply by Dec. 3 to Messrs. Forsyth & Maule, F.R.I.B.A., 309 Oxford Street, W.

SCOTLAND.—Dec. 4.—For the brick, joiner, slater, plumber and plaster works of caretaker's house, to be erected by the Stirling County Council at the Eastern District Offices, Falkirk. Messrs. A. & W. Black, architects, Falkirk.

SCOTLAND.—Dec. 13.—The Commissioners of H.M. Works and Public Buildings are prepared to receive separate tenders for the execution of:—(1) Excavator, mason and bricklayer

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works; (2) carpenter and joiner works; (3) ironfounder, smith, and ironmonger works; (4) slater work; (5) plasterer work; (6) plumber and gasfitter works; (7) painter, paperhanger, and gilder works; (8) glazier work; (9) blindmaker and bellhanger works in connection with ordinary works and repairs to buildings in their charge in (1) Edinburgh, (2) Glasgow, (3) Aberdeen, (4) Stirling, for three years from January 1 next. Mr. W. T. Oldrieve, H.M. Office of Works, Edinburgh.

Sheerness.—Dec. 5.—For the execution of internal repairs at the Sheerness Broadway, Sheerness Blue Town, and Sheerness Marine Town Council schools. Mr. A. Seymour Baskett, correspondent, 46 High Street, Sheerness, Kent.

South Shields.—Dec. 14.—For the enlargement of South Shields Post Office, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Postmaster of the South Shields Post Office, or H.M. Office of Works, Storey's Gate, London, S.W.

Stoke Canon.—Dec. 13.—For the erection of three cottages at Stoke Canon, near Exeter, for the Great Western Railway Company. The Engineer, Taunton Station.

Sutton-on-Hull.—Dec. 7.—For alterations and additions to The Hornbeams. Mr. Jas. J. Adamson, architect and surveyor, 5 Colonial Chambers, Prince's Dock Side, Hull.

Wales.—Dec. 5.—For erection of the following buildings, viz.:—Refreshment room, kitchen, bowls house and shelter in Cwmdonkin Park; bowls' house in Victoria Park; bowls' house in Dyfatty Park; and bowls' house, kitchen and shelter in Llewelyn Park, for the Swansea Corporation. Deposit 2*l.* 2*s.* The Borough Estate Agent, 3 Prospect Place, Swansea.

Wales.—Dec. 5.—For the following works, for the Glamorgan County Council, viz.:—(1) New girls' intermediate school at Porth; (2) boundary wall and railings at Porth new girls' intermediate school site; (3) alterations and additions to the infants' department of the Council school at Alltwen, near Pontardawe; (4) alterations to old school and erection of a cookery-room at Tirphil. The County Council Offices, Westgate Street, Cardiff.

Wales.—Dec. 6.—For erection of (*a*) fifty houses at Cwm Road, (*b*) fifty-three houses at Trewyddfa Common, Plasmarl, for the Swansea Corporation. Deposit 3*l.* 3*s.* The Borough Estate Agent, 3 Prospect Place, Swansea.

Wales.—Dec. 13.—For the enlargement of the telegraph office at Cardiff Station, for the Great Western Railway Company. The Engineer, Newport Station, Mon.

Washwater.—Dec. 5.—For the reconstruction of Washwater Bridge, near Newbury, consisting of a single brick arch of 21 feet span, for the Southampton County Council. Deposit 2*l.* 2*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Welshpool.—Dec. 8.—For erection of additions to the County schools, Welshpool. Deposit 1*l.* 1*s.* Messrs. Shayley & Ridge, architects, Oswestry and Welshpool.

West Dunston.—Dec. 7.—For erection of coal shipping staiths on the river Tyne at West Dunston, for the North-Eastern Railway Company. Mr. Charles A. Harrison, the company's chief engineer, Forth Banks, Newcastle-on-Tyne.

Whitley Bay.—Dec. 5.—For the construction of public conveniences on the south side of Watts Road, near the north end of the Promenade. Mr. A. J. Rousell, A.M.I.C.E., Council Offices, Whitley Bay.

TENDERS.

BEDFORD.

For Goldington and Renhold Waterworks. Mr. Arthur J. Martin, M.Inst.C.E., F.G.S., engineer.

Lincoln & Sons	£4,213 18 10
Hill	3,956 7 0
Southorn & Co.	3,600 0 0
Higgins	3,225 0 0
Macdonald	3,202 0 0
Wood & Sons	3,087 18 10
Wilmot	3,087 10 0
Sykes	2,889 0 0
Brebner & Co.	2,889 0 0
Wright & Co.	2,814 19 0
Lown & Co.	2,776 2 3
Davies, Ball & Co.	2,770 14 9
Trueman	2,639 0 0
Hopper, Woburn Sands (*accepted*)	2,565 11 1

BUSHEY HEATH.

For the erection of St. Peter's parish room, Bushey Heath. Mr. Geo. H. Fellowes Prynne, F.R.I.B.A., architect, 6 Queen Anne's Gate, Westminster, S.W. Quantities by Mr. R. Henry Hale, F.S.I., 6 Queen Anne's Gate, Westminster, S.W.

Goddard & Sons	£2,089 0 0
Brown	2,070 0 0
Wilkins & Sons	2,034 0 0
Waterman	1,967 0 0
Honour & Sons	1,948 0 0
Longley & Sons	1,889 0 0
Miskin & Sons	1,877 0 0
Bowman & Sons	1,876 0 0
Webster & Cannon	1,818 0 0
Norris & Sons (*conditionally accepted*)	1,792 0 0

EPPING.

For works for the Epping Board of Guardians. Messrs. Tooley & Foster, architects, Buckhurst Hill, Essex.

Pavitt & Sons	£2,600 0 0
Robins	1,915 0 0
Todd & Newman	1,906 0 0
Young & Son	1,864 0 0
Brand, Pettit & Co.	1,765 0 0
Cowlin & Sons	1,760 0 0
Wood & Sons	1,737 17 3
Smith & Sons	1,693 0 0
Winch	1,683 0 0
Day	1,620 0 0
Fitch & Cox	1,617 0 0
Strong & Co.	1,617 0 0
F. & E. Davey	1,600 0 0
J. & J. Dean	1,590 0 0
Paul	1,588 0 0
Appleby & Sons	1,584 0 0
Whiffin & Sons	1,572 7 9
Glasscock & Son	1,550 0 0
Foster & Son	1,549 0 0
Whiter & Co.	1,524 0 0
Lown & Co.	1,434 0 0
Clark & Sons	1,429 0 0
Oram & Son (*recommended*)	1,385 16 7

FOLESHILL.

For erection of a children's home in Lythall's Lane. Mr. A. E. Newey, architect, Foleshill, near Coventry.

Avis & Roy	£1,000 0 0
Orr Bros.	872 0 0
Kelley & Son	851 4 4
Randle	850 0 0
Lord	830 0 0
Isaac & Son	823 18 4
Corah & Son	814 16 2
Jones & Bacon	814 2 0
Shortridge	809 5 5
Forknell	753 7 0
Ault, Coventry (*accepted*)	710 9 0

IRELAND.

For the following works, for the Wicklow Urban District Council, viz.:—The construction of 725 yards of stoneware sewers from 6 inches to 18 inches in diameter, and erecting ventilators on the present sewers; also for laying 117 yards of 3-inch water main. Mr. J. Pansing, M.I.M.C.E., town surveyor.

Sewers and ventilators.

McKay & McNally	£1,378 12 9
Kinlen	1,164 15 3
Clarke, Wicklow (*accepted*)	1,140 18 0
Mosley	1,100 0 0

Water main.

Clarke (*accepted*)	38 9 3

LONDON.

For the electric lighting of the school buildings to be erected on the Hoxton House site (Hoxton).

Lawrance & Sons	£1,147 13 5
Central Motor Engineering Company	1,041 4 10
Newbald & Co.	934 0 0
Weston & Sons	895 10 0
Johnson & Phillips	870 0 0
Tilley Bros. (*recommended*)	738 7 9
Morgan	708 0 0
Troy & Co. (*withdrawn*)	615 0 0

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LONDON—*continued.*

For building new chapel at the Convent de L'Adoration Reparatrice, Beaufort Street, Chelsea, S.W. Mr. C. G. KEOGH, architect, 12 Girdlers Road, Kensington, W.

Cubitt & Co.	£10,501	0	0
Simpson & Co.	9,988	0	0
Colls & Trollope	9,955	0	0
Webber & Son	9,950	0	0
MILLS & SONS, Blackheath (*accepted*)	9,539	0	0

For the execution of the wiring and the supply of the necessary fittings in connection with the electric lighting of the London County Council fire-station in Parnell Road, Bow.

Fryer & Co.	£233	13	0
Malcolm & Allan	198	0	9
Johnson & Phillips	190	0	0
Tilley Bros. (*recommended*)	167	0	0
Chief Engineer's estimate	170	0	0

For the structural improvements of the Hamond Square school (Haggerston), for the London County Council.

Kirk & Randall	£14,825	0	0
McCormick & Sons	14,575	0	0
Shurmur & Sons	14,573	0	0
Johnson & Co.	14,250	0	0
Leng	14,149	0	0
Lawrance & Sons	13,946	0	0
F. & T. Thorne	13,876	2	6
Patman & Fotheringham	13,833	0	0
Godson & Sons	13,680	0	0
Appleby & Sons (*recommended*)	13,287	0	0
Architect's estimate	13,415	0	0

For alterations and repairs to lightning conductors, &c., at the Workhouse, Silver Street, Upper Edmonton, for the Guardians of the Strand Union.

Austin & Sons, Leeds.
Edgley, Bradford.
Ewart & Son, Euston Road.
DIXON & CORBITT and R. S. NEWALL & Co., 130 Strand (*accepted*).
Gold, The Broadway, Stratford.
Mitchell, Leicester.
Universal Engineering Co., Nottingham.
Weldon & Sons, St. Helens, Lancs.
Gray & Co., 5 Philpot Lane, E.C.
Cutting & Co., 1 Wardrobe Place, E.C.

MAIDENHEAD.

For the erection of an additional ward at the Isolation Hospital.

Cooper & Sons	£624	0	0
Creed	524	0	0
Cox & Son	519	0	0
Mead	511	0	0
EXORS. OF THE LATE MR. BISSLEY (*accepted*)	485	0	0

RUNCORN.

For the erection of a new block at the Isolation Hospital, for the Runcorn Rural Council.

FAIRCLOUGH, Warrington (*accepted*)	£2,188	0	0

SCARBOROUGH.

For making additions to house. Messrs. RICHARDSON, SON & BELL, A.R.I.B.A., architects and surveyors, Wakefield.

Accepted tenders.

Bastiman & Sons, builder	£117	0	0
Hovington, joiner	65	0	0
Clough & Tasker, plumber	43	7	6
Illingworth, tiler	28	1	0
Bastiman & Sons, plasterer	23	0	0
Bradley, painter	8	0	0

STOKESLEY.

For carrying out the Great Ayton private street works, for the Stokesley Rural District Council.

O'Doherty & Son	£1,019	5	2
Ellison	957	16	6
Hobbs	876	8	2
Pearson	871	17	4
PICKERING, West Hartlepool (*accepted*)	836	2	8

SCOTLAND.

For the works in connection with the drainage of the burgh, including the laying of 146 yards 12-inch cast iron, 450 yards 12-inch fireclay, and 685 yards 9-inch fireclay sewers, with the necessary excavations and inspection chambers, for the Burntisland Town Council. Mr. J. A. WADDELL, burgh surveyor.

Adamson	£1,045	19	4
Flett	850	0	0
Brebner & Co.	805	0	0
Robertson	786	7	3
Robb	764	7	9
Reynolds	750	0	10
Simpson	743	0	2
Blair	736	5	10
Wilson, jun.	729	0	2
Ritchie	723	4	4
Scott, Marshall & Co.	716	15	0
Davidson	693	9	3
Martin	623	13	3
CLARK & Co., Motherwell (*accepted*)	640	14	1

TIVERTON.

For hot-water installation at the Heathcoat Schools. Mr. J. SIDDALLS, architect.

Acme Heating Co.	£530	0	0
Holmes & Co.	460	0	0
Haden & Sons	444	0	0
Ditto (alternative)	438	0	0
Heating Engineering Co.	398	10	0
Korting Bros.	385	0	0
Wippell Bros. & Row	382	10	0
Crispin & Son	360	0	0
Russell & Co.	352	0	0
Spry & Co.	350	0	0
Rice & Son	342	0	0
Ashwell & Nesbit	328	0	0
Bramham	290	0	0
Akers & Co.	283	18	9
Talmage	282	10	0
Ditto (alternative)	327	10	0
Dargue, Griffiths & Co.	273	0	0
Brightside Engineering Co.	272	0	0
Wembley Heating Co.	246	0	0
Nott	235	16	0
Ditto (alternative)	166	0	0
GARTON & KING, Exeter (*accepted*)	225	0	0
Sale	216	0	0

WALES.

For additions and alterations to the Council school at Clarbeston, Pembroke. Mr. D. E. THOMAS, architect, Haverfordwest.

Harries	£575	10	0
Cole & Sons	565	0	0
WATTS & THOMAS, Haverfordwest (*accepted*)	535	0	0

For erection of a drill hall at Haverfordwest, for the Pembrokeshire Territorial Association. Mr. H. P. THOMAS, architect, Haverfordwest.

Adams	£3,700	0	0
Scott	3,597	8	0
John	3,438	0	0
Davies & Son	3,250	0	0
Davies & Francis	3,023	17	0
Rogers	2,900	0	0
REES & SON, Narberth (*accepted*)	2,765	0	0
Davies & Morgan	2,315	0	0

For erecting an infants' school, together with a centre for teaching domestic arts, at Fleur-de-Lis (Mon.). Mr. JOHN BAIN, F.R.I.B.A., Newport.

Leadbeater	£3,998	0	0
W. Williams	3,923	0	0
Spencer, Santo & Co.	3,876	0	0
Charles	3,846	0	0
Howells	3,753	0	0
Moon	3,600	0	0
Williams & Sons	3,549	0	0
Davies & Sons	3,500	0	0
Foster & Hill	3,495	0	0
Phillips, Clark & Co.	3,452	0	0
Jenkins	3,397	0	0
J. H. WILLIAMS, Newport (*accepted*)	3,349	0	0

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ARCHITECTS' FEES FOR A SCHEME NOT CARRIED OUT.

FOR professional services rendered in preparing plans for the reconstruction of Duff House, Banffs, Messrs. Sutherland & George, architects, of Crown Street, Aberdeen, brought an action before Mr. Justice Channell in the King's Bench Division on Wednesday, November 30. The defendants were C. Dewynter, Ltd., of Charing Cross Road, London, and the Banff Syndicate, Ltd. It appeared in the course of the hearing that the scheme prepared by plaintiffs had, in fact, not been carried out, though the quantities were taken out and tenders received in respect of it.

Mr. J. Sankey, K.C., for the plaintiffs, said that in addition to what they conceived to be due for work and labour done his clients were suing for moneys disbursed to the quantity surveyors. The defence raised by Chas. Dewynter, Ltd., was that plaintiffs were to look for payment not to them, but to a syndicate formed later under the name of the Duff House, Ltd. The Banff Syndicate's defence was that they never employed the plaintiffs at all.

In November 1907 the Duke of Fife presented to the township of Banff and Macduff a mansion house standing in 140 acres of ground, and the present dispute arose in connection with plans for turning the house into a high-class hotel or hydropathic. At first the two Corporations intended to carry out the change, and there was a competition in which plaintiffs, amongst others, submitted a scheme of alteration. Afterwards it was thought better to get a company to do what the townships had hitherto intended to do.

Messrs. Dewynter were offered an option to turn the house into a hydro or hotel, subject to the approval of the township. That option was ultimately exercised. Mr. George, one of the plaintiffs, had a brother who was town clerk of Macduff, and when the scheme for the township doing the work fell through this gentleman suggested that the plaintiff firm might do the architectural work. Mr. Sutherland, another member of the plaintiff firm, came to London in consequence. He first saw Mr. Dewynter, who referred him to Mr. Lionel Van Praag. Mr. Sutherland saw Mr. Van Praag, and had instructions from him on behalf of the syndicate to prepare certain sketch plans. Afterwards letters passed, and the plaintiffs acted as architects. On December 7 there was a discussion in London as to whether plaintiffs should have 2½ or 5 per cent. on the cost of the work. The architects said they would not have less than 5 per cent. Ultimately quantities were got out, and plaintiffs actually paid over 200*l.* to quantity surveyors for this purpose. Counsel suggested that they would hardly have done this if it had been arranged that they were to look for payment to a syndicate which was not at the time in existence.

His Lordship: Has the hydro ever come into existence?

Mr. Sankey said he believed part of it had, and was very successful.

Mr. Clement George, a partner in the plaintiff firm, said that at an interview Mr. Van Praag told him that his firm might be taken to have been appointed architects.

Was there, asked counsel, any agreement, as stated in the defence, that the plaintiffs should not be paid except by Duff House, Ltd.?—Never. The only mention of fees was when Mr. Van Praag said he thought that on such a large contract the fees should be 2½ per cent. I said our fees had to be 5 per cent. Witness added that 5 per cent. was the fee fixed by his local Association.

Cross-examined by Mr. A. Nielson for Dewynters, witness denied the suggestion that there had been an agreement under which no liability would be incurred by the defendants if the proposition did not go through as a whole.

Other evidence was called on behalf of the plaintiffs with a view to show that there was no agreement that plaintiffs should look to Banff House, Ltd., for their fees.

Mr. Whateley, on behalf of the Banff Syndicate, submitted that there was no case against his clients.

His Lordship refused to make the desired ruling on the ground that when the bills of quantities were got out the Banff Syndicate had come into existence, and the plaintiffs were directed to get tenders for the reconstruction for the Banff Syndicate.

Mr. Lionel Van Praag, giving evidence on behalf of Dewynter, Ltd., said he was assured by Col. George, the town clerk of Macduff, that if his brother's firm were given the work of preparing a scheme there would be no architects' fees unless the proposition went through.

Were you ever informed, inquired counsel, that Sutherland & George were going to employ an outside firm for the purpose of getting out bills of quantities?—Not to my knowledge. Witness stated that the response of the public to the offer of shares in Duff House, Ltd., was very feeble, and it had for that reason been unable to go on with the alterations.

The Judge: In consequence of the amount of money you got you did not alter in the manner you proposed, but simply opened without alterations.

Witness: Yes.

Cross-examined, witness admitted that though plaintiffs were not to look to Dewynters for payment he told them to get out bills of quantities.

Were they, inquired Mr. Sankey, to spend 240*l.* in order to enable you to promote the Duff House Company?—That was not my business. My view of the contract was that if they were going to spend 240*l.* they should have made application and got somebody's consent to the expenditure.

Mr. Henry Randall, chairman of Duff House, Ltd., said that company was incorporated with only 10,000*l.* worth of shares allotted. Of this 3,000*l.* had been found by himself and his partner.

As a matter of fact, inquired counsel, has the money ever been forthcoming to carry out these plans and tenders obtained by the plaintiffs?—Well, no. Certainly not. And Duff House, Ltd., never intended to do them. When I was a member of the Banff Syndicate I was against the policy of making the alterations.

In fact, have the Banff Syndicate made use of these plans in any sort of way?—No.

The Judge: After they got the plans they thought it was too big a scheme?—They had not the money. Witness said that in any work requiring the services of an architect plaintiffs had been employed by Duff House, Ltd.

His Lordship, in giving judgment, said this was a case not free from difficulty. He quite thought that the architects, having previously made plans for the competition, might have been willing to do small things and give assistance to the company in the hope of being appointed architects to the company. But Mr. Van Praag seemed to have understood that the defendants were entitled to ask the architects to do anything they pleased in the way of making and preparing plans. He seemed to think, in fact, that defendants might require the plaintiffs to do the architects' work for which they were ultimately to be paid 5 per cent. if the work was carried out, and that they might do that on the terms that Dewynters might order anything they liked, and plaintiffs had undertaken to do it. His Lordship did not think that was at all probable. If it had been meant he could not help thinking that when any substantial order was given involving some hundreds of pounds it would have appeared on the letter giving the order that the work was covered by the percentage provided if the work were, in fact, carried out. Defendants might have relied on vague promises supposed to have been given by a gentleman who was not a member of the plaintiff firm, but when they came to give substantial orders which would cause a large amount of work to be done, and for which the remuneration would be substantial, they should have said definitely such work was not to be paid for if that was what they meant. The whole difficulty arose out of the habit so many people fall into of not making definite arrangements as to what would happen in case a scheme did not go through.

Dewynters, continued his lordship, gave orders and gave them for the quantity of work charged for. These orders were given before the Banff syndicate was incorporated. But (at any rate towards the last) it was known that the Banff Syndicate was to be incorporated for the purpose of carrying on this matter. It therefore would not take very much to show liability undertaken afterwards by the Banff syndicate. But such a liability if created would, it seemed to him, be in substitution of the liability of the Dewynter Company's liability, and he thought there was not enough to prove that. In his view, the liability remained with the people who gave the orders. There would therefore be judgment for the plaintiffs for 810*l.* against Dewynter, Ltd., with costs, and judgment for the Banff Syndicate with costs, but there would be an order that Dewynter, Ltd., should repay the plaintiffs the costs they had to pay the Banff Syndicate.

THE Governors of the Radcliffe Infirmary and County Hospital, Oxford, at a special general meeting last week, gave sanction for the preparation of plans and specifications for a new pathological laboratory and out-patients' block, the cost of such buildings not to exceed 20,000*l.*

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TRADE-MARKS OF CONSTRUCTIVE MANUFACTURERS.

WE have received from Jacques Gevers & Co., L'Agence de Brevets et Marques de Fabrique, 70 Rue Saint-Jean, Antwerp, the following list of trade-marks published in July, August, and September, 1910.

ENGLAND.

Cement.

"LOYALTY" . . Stedman, Crowther & Co., Lime Street, London.
"MABORITE" . . Mabor, Ltd., 23 Fitzroy Square, London.
"CATHEDRAL" . . Sussex Portland Cement Co., Ltd., Newhaven, Sussex.

Constructive Materials.

"ARMEET" . . . Frans Richard Alexander Sundell, Stockholm.
"DREDNAUT" . . Thomas Broad, Ltd., Worcestershire.
"LIVERNIA" . . Drummond & Co., Liverpool, Lancashire.
"TRIUMPH" . . Triumph Cycle Co., Ltd., Warwickshire.
"MOL-CON" . . . Moeller & Condrup, Ltd., London, E.C.

Paints, Varnishes, and Various Preservative Compositions.

"FLETTO" . . . Ripolin, Ltd., London, E.
"POLO" . . . A. Leete & Co., London, S.E.
"DURESCO" . . Silicate Paint Co., Ltd., Kent.
"RED HAND" . . Suter, Hartmann & Rahtjen's Composition Co., Ltd., London, E.C.
"BLACKBIRD BRAND" / "BLACKBERRY PAINT" } Callender's Cable & Construction Co., Ltd., London, E.C.
"AEROTONE" . . George Malinson, London, S.W.
"DAMARDA" . . Damard Lacquer Co., Ltd., London, S.W.

FRANCE.

Constructive Materials.

"PALATINA" . . Pfälzische Chamotte und Thonwerke Actiengesellschaft, Eisenberg.
"PROGRESSO" . . Théodore Weiser, 46 Rue d'Enghien, Paris.
"ARNAUD ETIENNE & Co." Soc. an. des Tuileries et Briqueteries de Marseille, St. Henri.

Paints, Varnishes and Various Preservative Compositions.

"H.N." . . . Noble et Hoare, Ltd., 3 Cornwall Road, Stamford Street, London.
"MATADOR" . . Marius Dufour et Fils, 69 Rue d'Italie, Marseilles.
"AQUA FUGIT" . . Combe, Eugène Emile, 21 Rue du Louvre, Paris.
"MINIUM DE ZINC" . Gustave Ferrier, Asnières.
"TREGONA" . . . Tabor, Trego et Co., Ltd., 41 Bishopsgate Street Within, London.
"PAQUERETTE" . . F. Buisson, Puteaux.
"LUSTRE ROYAL" . Arthur Bridoux, Paris.

GERMANY.

Cement.

"TEKELIA-EXTRA" . Tecklenburger Kalk- und Cementwerke, Lengerich.
"B.G." . . . . Brelitt-Gesellschaft, Bremen.

Constructive Materials.

"BEROLINA" . . Charlottenburger Asphalt und Dachpappen Fabrik, Fischstrasse, Hildebrandt.
"ORKAN" . . . Carl Grähn, Berlin.
"TECTOLINEUM" / "TECTORIUM" } Malchow, Leopoldshall.

HOLLAND.

Cement.

"PALTAC" . . . Beer, C. F. Söhne, Keulen.

LUXEMBURG.

Constructive Materials.

"ULTRA-CAPITAL" . Seebohm & Dieckstahl, Ltd., Mannheim.

SWITZERLAND.

Cement.

"ANTIFRIG" . . Ruppmann & Co., Zürich.

Constructive Materials.

"PORRYT" . . . Anton Petersen, Lucerne, Switzerland.
"TRIANGLE" . . Joseph Koch & Co., Gipsteinfabrik, Lucerne Switzerland.

Paints, Varnishes and Various Preservative Compositions.

"N.H." . . . Noble & Hoare, Ltd., London.
"PEINTRE" / "ROYALIN" / "EXCELSIOR" } Standard Lack- und Farbenwerke (formerly Naegely, Amberger & Co.), Altstetten, Zürich.

VARIETIES.

THE Bilston District Council have approved plans for the erection of a new foundry by Messrs. S. Thompson & Sons, of Ettingshall.

AXMINSTER Cottage Hospital Committee have appointed a sub-committee to formulate a scheme for the building of a new hospital.

MESSRS. R. E. W. BERRINGTON, SON & WATNEY, engineers, Wolverhampton, have been instructed to prepare a scheme for the extension of Evesham sewage works, at a cost of 9,000*l.*

AT Troon Dean of Guild Court on Monday plans were passed for the erection of a destructor on the North Shore, for the disposal of the burgh refuse, at the estimated cost of 4,420*l.*

THE Reading Education Committee have given notice of their intention to provide a new Roman Catholic public elementary school for about 200 children at St. James's, Abbey Ruins, Reading.

THE Port of London Authority propose to ask Parliament next session for power to acquire a site in the neighbourhood of the Tower for the erection of large new offices. The project will involve the clearing of a considerable area in Savage Gardens and Trinity Square, and will likewise mean the acquisition of Muscovy House, a large block of modern business offices.

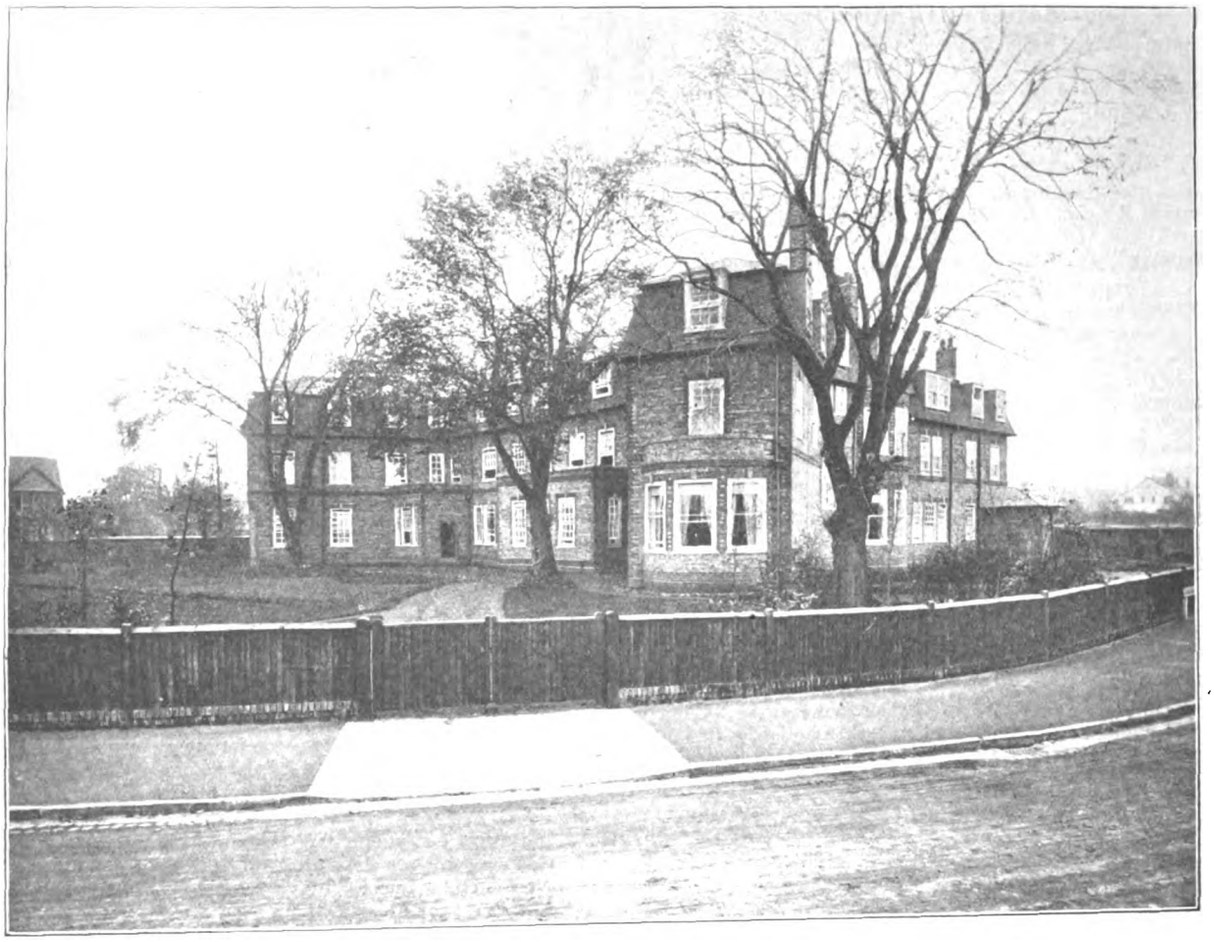
THE Salford Education Committee on Monday decided that the Municipal Secondary School for boys should be removed from the Technical Institute, and that a new building should be erected on a site in Leaf Square. The Board of Education have provisionally approved the site and sketch plans. Application will be made for sanction to a loan of 2,920*l.* for the purchase of the site. It was further decided to apply to the Local Government Board for sanction to a loan of 6,550*l.* for the erection and furnishing of a school for infants in Robert Hall Street.

MR. FROWDE is adding to the Church Art in England series another book by Mr. Francis Bond on "Wood Carving in English Churches." An earlier volume was devoted to misericords, and in the second, which will be ready immediately, Mr. Bond treats of stalls and tabernacle work, Bishops' thrones, and chancel chairs. There were 241 illustrations of misericords; there are to be 124 illustrations of stalls, &c. The third volume on wood carvings is being written by Mr. P. M. Johnston, and will deal with church chests, almeries, organ cases, doors, alms and collecting boxes.

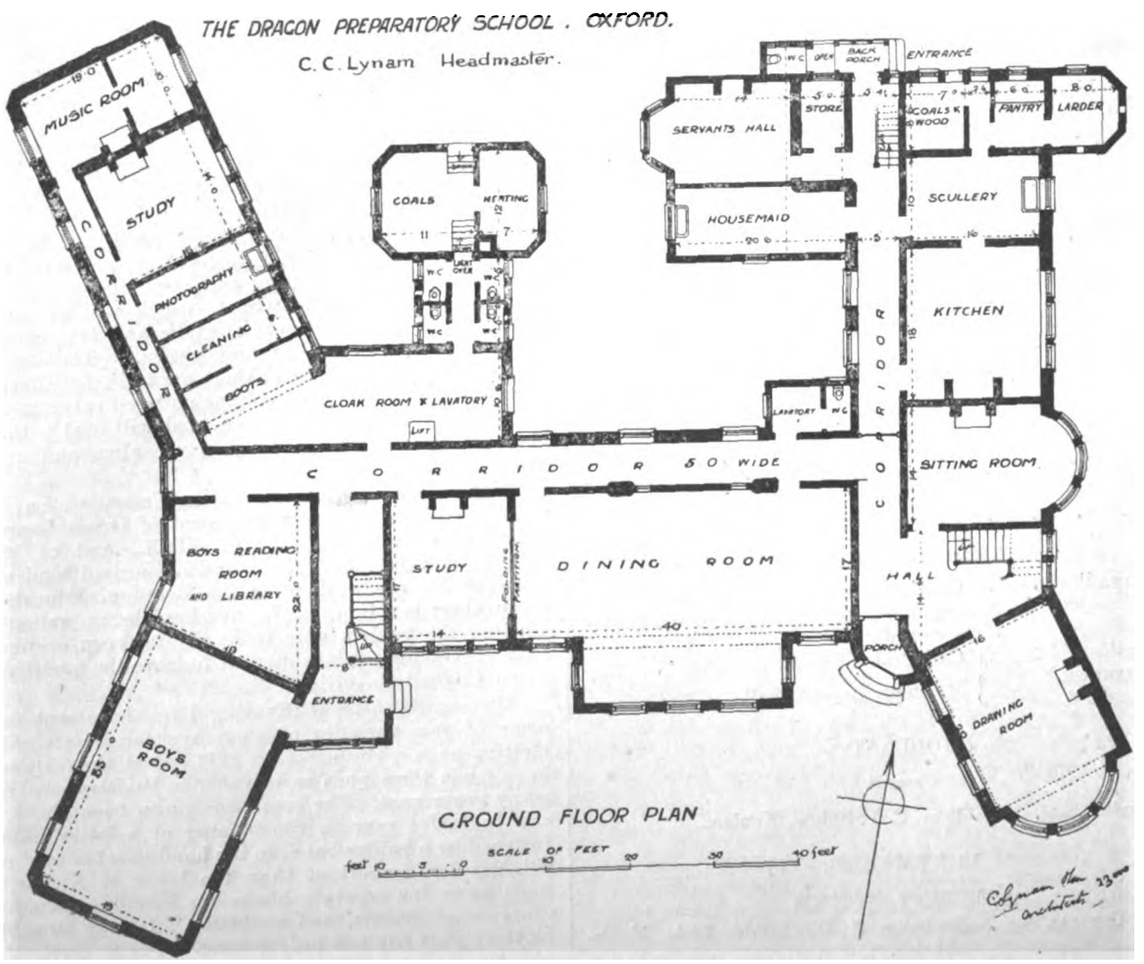
THE Sutton Coldfield Education Committee on Monday approved plans for the enlargement of Green Lanes Boys' School at an estimated cost of 4,500*l.*, and of Walmley Schools at a cost of 1,350*l.*, and authorised tenders to be obtained for the work when the Board of Education had given their sanction. The question being raised as to whether the tenders were to be thrown open or limited to local contractors, it was decided to leave the question to the Town Council to settle.

MESSRS. HUDSON & KEARNS, LTD., have sent us specimens of five varieties of their registered date-indicating blotting-pads. The series for 1911 repeat the feature which have made these pads so valuable to business men for very many years past. The specimens range from No. 4, which can be folded over in the manner of a letter wallet and fastened by a rubber band, to the handsome bankers' edition. Slightly less important than the latter is No. 8A, which finds room for separate blocks for standing memos., book diary, engagements, and scribbling. It may be said these blotting-pads are not only among the most serviceable but also the most sensible in the market.

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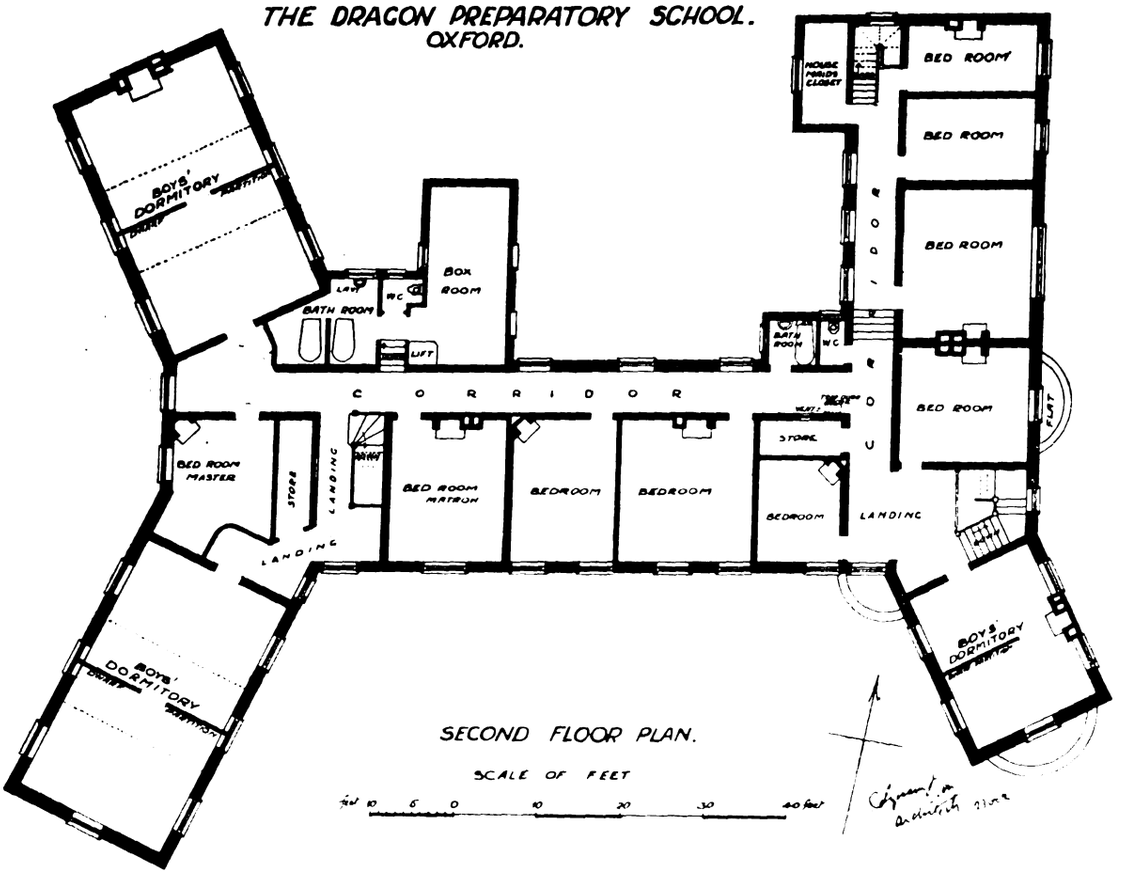


THE DRAGON PREPARATORY SCHOOL, OXFORD.—Messrs. C Lynam & Son, Architects.

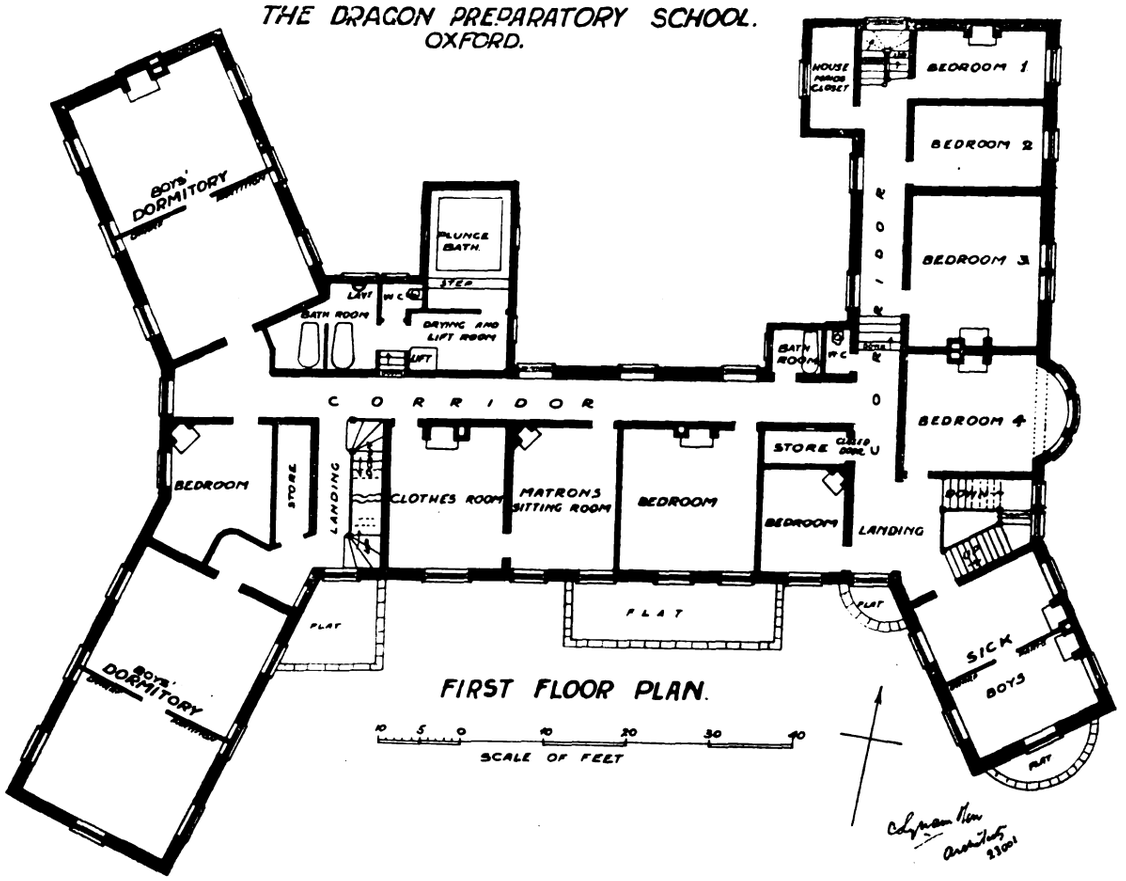


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THE DRAGON PREPARATORY SCHOOL.
OXFORD.



THE DRAGON PREPARATORY SCHOOL.
OXFORD.



DRAGON PREPARATORY SCHOOL, OXFORD.

IN preparing the design for the Headmaster's house and accommodation for boarders, the main idea has been to give an interior which should in every part of it receive direct light and air, and that every habitable portion should have a face to the sun's rays.

With regard to the exterior nothing superfluous could be admitted having regard to the great cost of the essential accommodation; therefore substantiality of structure, and a simple common-sense treatment of the elevations prevails throughout. The new house has been built on a spacious plot of ground immediately opposite to the school built some years ago, with its sports' field adjoining. Additional class rooms and a drill-hall have also been added to the schools.

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THE PROBLEM OF THE ARCHITECT'S ASSISTANT.*

(Concluded from last week.)

Few as the architect's opportunities are at present, it cannot be said that he has not always shown himself eager to take advantage of them; but they are at present far too few for him to place any reliance on them as providing him with a means of establishing himself in his calling.—His chances of obtaining recognition are mainly confined to the opportunities afforded by an occasional open public competition, while within the profession itself his chances of obtaining a decent living as a capable assistant are becoming more and more restricted, and without capital or influential support his chances of creating a private practice for himself are nil. While there exist these obstacles to his advance, he is pressed upon from behind by a constantly flowing stream of new recruits into the profession. This problem of the wholesale creation of fresh assistants for the convenience and profit of the practising architect is another of those internal causes affecting the position of the assistant which it would be worth his while to inquire into and, if necessary, take action on. I fear that he will raise a storm of protest if he does take action, and it will be necessary for him to tread cautiously; but one cannot make omelettes without breaking eggs, or "take arms against a sea of troubles" without the risk of sundry hard knocks in the process. He will probably be told to mind his own business, to refrain from casting aspersions on his employers, and, above all, to desist from touching that "abomination of desolation" known as trade union tactics. But the man who wears the shoe knows best where it pinches, and those who suffer most from the manufacture of an overcrowded market have the best right to inquire into the process of manufacture, and to call the manufacturer to account. You will, of course, be told that you have really no just cause to complain, because all markets are overcrowded, always have been overcrowded, and always will be. To a certain extent, no doubt, this is true, although in our case, and within my own recollection, there have been times when it was certainly not so true as it is now. But what we have really to complain of is not so much the overcrowding as the way in which it acts. It might be supposed that by the operation of the law of the survival of the fittest that it is the incompetent assistant who would be squeezed out or suffer most from the pressure, whereas, on the contrary, it is the competent assistant who most rapidly goes to the wall. If in the daily competition of both the architect and his assistant quality of work was the determining factor, then both the incompetent architect and the incompetent assistant would be quickly eliminated. But quality of work is not the determining factor; the question is one of quantity and cheapness, and the effect of overcrowding on the competent assistant is to force him either to come down in his price to the level of the incompetent man or to leave the market. Taking the Associateship of the Institute as indicating a certain standard of competence on the part of its possessor, can it be denied that its market value has for years been steadily declining, so much so that we now find public authorities advertising without the slightest shame for an Associate of the Institute at a salary which they would hesitate to offer to a competent road foreman? This steady decline in the value of the Institute's qualification does not appear to trouble the authorities of that body very much. It may be that they have no remedy to suggest, or it may be that they too are rather afraid of the ground they may have to tread upon. But to attempt to cover the matter up by telling the assistant that his position is merely a transitory one, and that it is a waste of valuable time on his part to trouble himself about such a minor matter as the amount of his salary, is mere trifling with a serious subject. Suppose that, taking a leaf out of the registrationists' book, the assistants were to turn round and say, "We agree with the principle of registration, and we demand that any Registration Bill shall contain a clause requiring every architect employing an assistant to employ only duly qualified men at a scale of salaries to be fixed, and that he shall not have at any time more than a stated number of unsalaried assistants or pupils in his office." I am not advocating any such proposal myself, believing, as I do, far more in the free action of general opinion than in the methods of Parliamentary compulsion, which have a tendency to act in unexpected ways. But I think if this claim were to be put forward concurrently with any Registration Bill the promoters of the Bill would have some difficulty in rebutting it. The principle, indeed, has already been adopted by Parliament in connection with schools desiring to be recognised by the Board of Education. In this, as in all other matters I have referred to, the assistant must apply his own efforts to find a solution, and abandon the passive attitude of merely waiting for something to turn up in his favour. It is no longer sufficient for him to await opportunities; he must assist in creating them. Let him assert the reality of his existence as a necessary and vital part of the profession, and not a mere hanger-on to the tail of it, and opportunities will certainly open out to him—opportunities not only for improving his position as an assistant, but for realising his ambition to become a practising architect.

And now, finally, as regards the charge of Trades Unionism which is foolishly levelled against this movement by those whose sole notion of a Trade Union is that it is an organised tyranny of the incompetent majority over the competent few. If the pure doctrine of individualism is so extremely precious, surely the Institute trespassed when it condescended to draw up a recognised scale of fees, whereby the value of the architectural services of the unknown and possibly incompetent Mr. Brown is exactly equivalent to that of Sir Aston Webb. The main difference in this respect between the Institute and the Bricklayers' Union is that, while the bricklayers have managed to maintain an efficient control over their standard, the Institute has often to deplore a lack of *esprit de corps* in its members. If we err in this matter, we do so in good company, for there is no difference in principle between a union which seeks to establish a recognised scale of fees and one seeking to establish a recognised scale of wages. The principle of union for a common end is, of course, open to abuse, and no doubt has been and will be abused, but the same can be said of every principle known to political and social science. The effective usefulness of any combination of men in the cause of progress depends at the bottom on the personal worthiness of its individual members. I am reminded of the following words, spoken fifty years ago by a trade unionist to his fellows, which seem to me worth quoting and bearing in mind: "The utmost laws can do, whether enacted by Imperial Legislature, municipal authority, or voluntary associations, is to remove obstacles from our path; progress in that path must be the result of our own efforts. The honour of the craft does not depend on the laws by which it is protected, but upon the intelligence and skill of each individual craftsman, and we must not mistake the removal of obstacles for actual progress."

In drawing this somewhat rambling paper to a conclusion, I may say, in anticipation of your criticism, that I feel I have been dealing largely in generalities; that in referring to the problem of the architect's assistant I have done little to clear it up, and have told you nothing you do not already know. I have not offered you any cut-and-dried method of dealing with the problem because I know of none, nor do I think there is any. The solution will prove to be a business of trial and error; but I should not have dealt with the matter at all if I did not think that a solution is both possible and desirable in the interests of all those who profess and call themselves architects.

* A paper read by Mr. J. V. Hibbert, F.S.I., at a meeting of the Guild of Architects' Assistants, on November 8.

THE HYGIENIC ASPECTS OF ILLUMINATION.*

Public attention has of late years been drawn to the importance of the hygienic conditions under which industries are carried on and the prevention of industrial maladies. Good ventilation, good air, and adequate sanitation are now regarded as essential conditions for the preservation of health of employés in factories and workshops, and good illumination, it may be suggested, is every whit as vital.

Moreover, not only the workman, but also the employer benefits by the maintenance of good lighting conditions, for the expense involved in making the necessary improvements is usually trifling in comparison with the better quality and greater output of work which would result. This is now well recognised, and there is a widespread desire for more definite recommendations on the subject of factory lighting.

America and the chief countries of Europe have recently been devoting special attention to the matter. For example,

* Abstract of paper presented by Léon Gaster at the Second Congrès International des Maladies Professionelles, Brussels.

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efficient lighting is required in general by the Factory Acts of France, Germany, Switzerland, and the United States. In Holland the employment of women and young children is even forbidden in works in which artificial lighting is normally required between 9 a.m. and 3 p.m. In addition, an illumination of about 1.5 foot-candles is specified as the minimum for certain processes exceptionally trying to the eyes, such as embroidery, engraving, jewellery, draughtsmanship, knitting, quilting, &c., and a minimum of 1 foot-candle in other less exacting occupations. Moreover, it is stated that a special bill relating to the control of industrial lighting generally is also being prepared for introduction into the New York State Legislature.

There is, therefore, good precedent for the view taken by the Home Office in this country as to the importance of this matter. H.M. Chief Inspector of Factories in Great Britain, in his annual report for 1909, laid special stress on the need for good lighting conditions. "The importance of adequate lighting," he said, "is obvious. On the health side it is hardly necessary to point out that inefficient illumination entails risk, strain, and ultimate damage to the sight, or that it tends to neglect of cleanliness and adds to the risk of working in poisonous materials." Dr. T. M. Legge, Chief Medical Officer of the Factory Department of the Home Office, has laid stress on the value of good lighting conditions, especially abundance of daylight, as a preventive in those trades which tend to give rise to tuberculosis, and as a means of combating consumption.

The Home Office are now making a special study of the question of conditions of illumination in factories, and are providing for the collection of data bearing thereon

In attempting to deal with illumination, we must remember that good results can only be secured by the joint efforts of the engineer, the oculist, and the architect. The whole question of illumination depends upon the behaviour and well-being of the eye, and the medical profession are, therefore, intimately concerned.

At the same time, new developments are constantly taking place, and newer and brighter sources, with the technical details of which the engineer is chiefly familiar, are replacing the old lights of the past. In one respect these new sources are notably different from the lamps they are superseding. The "intrinsic brilliancy" or "candle-power per square inch" is much greater, and the lights are therefore apt, if misused, to be dazzling to the eye. For this reason it is most essential to arrange the sources wisely, so as to avoid any tendency to glare, and especially in the case of workshops and factories where people are exposed to artificial light for long periods of time. Lights should therefore be placed outside the direct range of vision, and advantage should be taken of appropriate shades and reflectors so as to direct the light where it is wanted and to screen it in directions in which its brilliancy would be inconvenient.

Again, there are many industrial processes, such as those which take place in lamp factories, glass and iron works, welding operations, &c., where workers may be exposed to the rays of these bright illuminants, and proper methods of protection are most important. But it has been suggested that it is not only the intrinsic brilliancy that is harmful. Dr. Stockhausen and others have laid stress on the effect on the eyes of the ultra-violet invisible rays, and attributed the severe inflammation following incautious exposure to powerful lights to this cause; this question requires further examination before definite recommendations can be made.

It has also been suggested that the prevalence of cataract among glass-workers is due to the peculiar radiation given out by the molten material, and an inquiry is now being conducted into the matter.

Yet another aspect of the subject which deserves to be emphasised is the tendency of bad conditions of illumination to lead to accidents. Naturally mishaps are more apt to occur when the machinery cannot be clearly seen, and it is to be noted that the Fidelity and Casualty Co., of New York, in a recent report placed defective lighting first in the list of causes of accident.

Much has also to be learned concerning the degree of illumination required for different purposes, not only as regards factory-lighting, but also in libraries, schools, and other public buildings. In Holland, as mentioned previously, legislation already prescribes a minimum order of illumination for certain classes of work, and similar recommendations are also being considered in other countries.

It may be added that international co-operation is very desirable in order to secure general agreement as to methods of measuring and expressing illumination. During the last year an important step was taken in the adoption by France, Great Britain, and the United States of a common unit of light, but we are still in want of a similar agreement regarding the unit of illumination. In order to be able to specify exactly the conditions of illumination it is essential that the measurement of illumination should come to be generally practised and regarded as a reliable and practicable process. Considerable progress has recently been made in the improvement and simplification of apparatus for this purpose.

This furnishes one more illustration of the need for co-operation between engineers, architects, and the medical profession. The engineer ought to bear in mind the views of the oculist, school and factory inspectors, medical officers of health, &c., as to what constitutes hygienic illumination. They in turn could benefit by the methods of precise measurement contrived by the lighting engineer.

It is only by the co-operation of these different experts that the questions which are now arising in connection with illumination—questions of great public and industrial importance—can be adequately studied, and the Illuminating Engineering Society was formed in London last year with the object of bringing together these different experts and providing for the collection of the needed data on the subject.

In order to facilitate the exchange of views of experts of different nations on these matters the Illuminating Engineering Society has also been organised on an international basis, and has among its corresponding members authorities in different parts of the world.

THE AERATION OF PORTLAND CEMENT.

AT the Ordinary Meeting of the Institution of Civil Engineers on November 22, Mr. Alexander Siemens, President, in the chair, the Paper read was "Portland Cement, and the Question of its Aeration," by H. K. G. Bamber, Assoc.Inst.C.E. The following is an abstract of the Paper:—

Much has been said and written on the subject of Portland cement, but in connection with the chemical or physical side there is still a wide field for research, as uncertainty exists on many of the complex problems which continue to baffle skilful investigators. The methods of manufacture in the past were known to but few, who with well-established brands of a new and eminently useful material, had practically a monopoly of the trade in the United Kingdom, and, for a considerable period, of the trade of the world. Contrary to the practice during recent years, when the engineer has prepared the specification detailing the properties of the material he proposes to use, the manufacturer then held the engineer in the hollow of his hand. The increase in the number of cement-works in various parts of the country soon caused the supply to overtake the demand, with the inevitable result that the handsome profits realised in the early days of the industry were diminished, never to return to their former level. It was not until a later date and towards the end of the nineteenth century that development on scientific and economic lines was undertaken by many of the principal manufacturers in all parts of the world. Their efforts met with the full appreciation of the members of the engineering profession who, by varied experience, became fully acquainted with the properties and eccentricities of the cements of the past. Great improvements were brought about through the initiative of Sir John Wolfe Barry, Sir William Matthews, and others, and a scientific system of standardisation has now been established, resulting in great influence for good, as well on the commercial as on the technical side. The industry as a whole, having accepted these conditions, has improved the methods of manufacture by large expenditures of capital in the way best adapted to meet local conditions and the character of the raw materials to be dealt with. The state of things prevailing in the cement industry in the sixties, and the costly and tedious methods which it was generally necessary for the engineer to adopt before the cement then supplied to him could be safely used were due to the almost entire absence of that scientific chemical control which is an essential part of the methods of to-day. The importance of thorough amalgamation of the raw materials and of the chemical uniformity resulting was not then fully realised, or, if it was understood, no adequate provision was made for producing so perfect a mixture as is now obtained. Further, the subsequent calcination was often carried out in a very perfunctory manner, without any

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successful attempt being made afterwards to separate the unburned portions from those which were thoroughly calcined. The defects being caused chiefly by the presence of uncombined lime, due either to faulty amalgamation of the raw materials or to insufficient calcination, or to both, the engineer wisely had recourse to the simplest and most natural methods for neutralising its expansive force, by converting the free lime into hydrated carbonate of lime by absorption of moisture and of carbonic anhydride from the atmosphere, with the object of rendering it inert. In treating cement in bulk this is a tedious and expensive process, but with the knowledge then available perhaps no better system could have been devised to secure soundness and freedom from expansion. Many engineers—especially those whose experience extends over a long period—have become so accustomed to the use of some aerating process that, perhaps by force of habit, they still continue to require it of their contractors, forgetting that cement which has already passed the stringent tests of the British Standard specification, has necessarily shown itself to be entirely innocent of any expansive tendencies. If this specification is adhered to for all requirements, the old aeration methods have become as obsolete as the ancient machinery of the cement industry which has found its way to the scrapheap. Photographs were given showing the effects of boiling on briquettes made with sound and unsound cement respectively.

The improvements which have been effected, particularly since the end of the nineteenth century, have lifted cement-making to a high position in the list of scientifically-conducted industries. Given efficient chemists, now an important part of the staff, no difficulty is experienced in obtaining continuously a well-proportioned mixture of the raw materials, whatever their character; and by means of specially-designed machinery these materials are so effectually reduced that it is usual to find 95 per cent.—calculated on the water-free material—capable of passing through a screen of 32,400 meshes to the square inch. This is as near perfection as it is commercially possible to attain, and with proper calcination, the clinker should contain only traces of free lime, by which is meant amorphous calcium oxide capable of hydration or slaking with expansion, as distinct from the crystalline form in which it is said to exist, together with the silicates and aluminates of lime, in solid solution. Crystallised oxide of lime in this form is thought by some of the most recent investigators of the subject to be relatively inert, hydrating or slaking very slowly without expansion or evolution of heat, whereas the amorphous oxide of lime slakes immediately upon the addition of water, giving off considerable heat with a large increase in volume. It is the absence of lime in this latter condition in modern cements which renders futile any attempt to improve them by aeration.

One of the most important improvements in the manufacturing process is the introduction, on a practical scale, since 1900, of the rotatory kiln. Its advantage is that the calcination is completely under control. The Author proceeded to describe the process in detail, and also that of grinding, an operation to which much attention has been given of late years. Another great improvement in the production of sound cement, and the one which renders subsequent aeration unnecessary, is the introduction of the hydration process carried out in conjunction with the grinding; it consists in submitting the cement, during its final reduction, to a saturated atmosphere at a comparatively high temperature. The process results in achieving in a scientific, rapid, and highly efficient manner what the aerating operations of the engineer have only imperfectly effected on the cements of the past. It also has a markedly beneficial effect in regulating the setting-time, and in rendering it more permanent, by preventing to a large extent the return of the cement to a quick-setting condition, a danger which exists when gypsum alone has been used to retard the setting-time. Lastly, there is the cooling process, where the hot cement on leaving the mill is conveyed to revolving water-jacketed coolers. This operation, being conducted in the presence of air, adds the finishing touch to the beneficial results of the previous hydration.

Contrasting, therefore, the properties of the cement manufactured under rule-of-thumb processes of the past with those of the best cements made to-day, it should not be difficult to convince engineers of the desirability of abandoning an obsolete method of treatment. A means of diagnosis is now in the hands of the engineering profession in the form of the British Standard specification, and there is no necessity to, as it were, impair the vitality of the patient by treating him for a complaint which can be proved to be non-existent.

THE TURIN EXHIBITION, 1911.

A large number of applications has been received for space in the British Industrial Court, at the Turin Exhibition, and there is every promise of a thoroughly representative display of the various industries of this country.

This is most gratifying from a national standpoint. The German Press has been speaking in emphatic terms of the great advantage which the magnificent display made by the chemical manufacturers of Great Britain has given us in the markets of the world; and there is reason to anticipate that, as a result, a vigorous effort will be made to eclipse us at the approaching exhibition in Turin.

In view of this the Chemical Industries committee of the British Royal Commission is already considering how the recently organised Chemical Court which attracted so much attention at the Brussels Exhibition may be improved.

America, too, is doing her utmost. A report which appears in one of the United States trade journals urges American manufacturers of machinery and machine tools to utilise to the fullest extent possible the sudden and unprecedented commercial and industrial "spurt" being made by Italy. Here again it is evident Great Britain must exert herself if she is not to be left behind in the race for fresh markets.

At the meeting of the Association of Chambers of Commerce of the United Kingdom it was resolved that "in view of the success which has attended the collective exhibits of the Chambers of Commerce at the Brussels Exhibition, and their effectiveness in directing attention to the staple industries of this country, the Association strongly recommends all the Chambers representing manufacturing industries to organise collective displays of their products in addition to the industrial exhibits of their members for the Turin Exhibition to be held next year."

In view, therefore, of what the Exhibitions branch of the Board of Trade is doing for British exhibitors, it is hoped that nothing will be left undone to make the next official British section an even greater success than the last.

TRADE NOTES.

Mr. Joseph Norris, of Smeaton Street, Hull, supplied the 2,400 tip-up and movable chairs fixed in the Central Hall at Tooting, London, S.W.

We have received from the Shap Granite Company, Ltd., of Albert Square, Manchester, a glass paper-weight which contains an excellent facsimile example of their dark Shap polished granite.

The Llanfrynach new Parish Hall and the Grafham Church Schools, Guildford, are being supplied with Shorland's patent Manchester grates, roof ventilators, and inlet ventilators. The Salford Royal Hospital extensions are being supplied with Shorland's double-fronted patent Manchester stoves with descending smoke-flues and patent Manchester grates; and the New Theatre, Shirebrook, is being ventilated by means of Shorland's patent exhaust roof ventilators, supplied by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

The 1911 edition of *Spon's Architects' and Builders' Pocket Price Book* will shortly be ready for publication. The book has been divided into two sections:—"Memoranda and Tables," price 2*s.* 6*d.* net; "Prices and Diary," price 2*s.* 6*d.* net. The diary, showing a whole week at an opening, is a new feature of the "Prices and Diary" section, and is printed on India paper. The whole has been subjected to a thorough revision. To distinguish the two parts the "Memoranda and Tables" will be bound in red, the "Prices and Diary" will retain its green colour. Both sections are still real pocket-books, and contain a vast mass of information in a very handy and portable form.

The Education Committee of the London County Council have approved plans for a new school accommodating 1,352 children, to be erected in lieu of the existing Vauxhall Street Council School, Kennington, and also for a domestic economy centre in connection therewith.

The Guardians of the Ticehurst Union are desirous of making improvements to the cooking and laundry arrangements at their workhouse, Flimwell, Hawkhurst, and for that purpose invite engineers to propose schemes and prepare detailed specifications, and also give tenders for carrying out proposed works. The specifications must be sent in by December 21.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

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EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

COVENTRY.—March 1.—The Corporation contemplate the erection of municipal offices in the centre of the city, and also possibly a town hall, and accordingly invite competitive designs. Mr. E. Guy Dawber, F.R.I.B.A., will act as assessor. Deposit 2*l.* 2*s.*, which will be refunded on receipt of a bona-fide design or if the particulars are returned within fourteen days of receipt. Mr. Geo. Sutton, town clerk, 10 Hay Lane, Coventry. (For further particulars see advertisement, November 18.)

CUBA.—April 15.—An international competition has been arranged for a Presidential Palace to be erected at Havana at a cost of about 205,000*l.* Premiums of 10,000 pesos and 5,000 pesos will be awarded. Conditions may be seen at the Cuban Legation, 3 Grosvenor Mansions, Victoria Street, S.W., or the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C.

ISLE OF MAN.—Dec. 14.—The owners of the Villa Marina, Douglas, invite designs for pavilion and laying out pleasure gardens, &c., at a cost of 16,000*l.* One award of 200*l.* and two of 100*l.* will be made, the design becoming the absolute property of the landowners. Send 1*l.* 1*s.* deposit to Mr. Alexander Robertson, Town Clerk, Town Hall, Douglas.

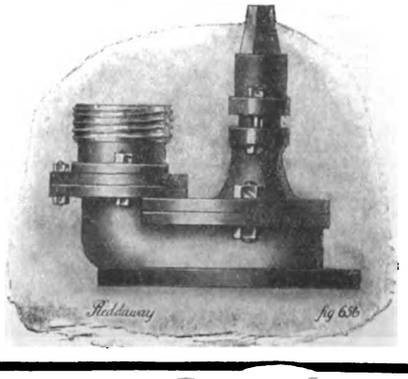
PENRITH.—Feb. 8.—The Governors of Queen Elizabeth's Grammar School, Penrith, are prepared to receive competitive designs for the erection of a secondary school, accommodating 200 students, with provision for the conduct of technical and evening classes. Premiums are offered to competing architects—viz., first, 50*l.*; second, 25*l.*; third, 10*l.* Printed instructions will be forwarded upon receipt of stamped addressed large-post official envelope. Mr. James Cropper, The Vicarage, Penrith, clerk to the Governors.



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ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Class IV.—Town plan of Gidea Park—prizes of 100*l.* and 50*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs; Class IV., March 31, 1911. Mr. Michael Bunney, A.R.I.B.A., hon secretary, 33 Henrietta Street, Strand, W.C.

SOUTHPORT.—The Corporation invite architects practising in Southport to submit designs for a new public elementary school at Churchtown. Premiums of 50*l.*, 25*l.*, and 15*l.* will be paid to the authors of the first, second, and third successful designs. Full particulars, &c., may be obtained from Mr. J. Ernest Jarratt, town clerk, Town Hall, Southport.

TAUNTON.—Jan. 21.—The education committee invite architects, practising in the Borough of Taunton, to submit competitive designs for a provided school for 440 children. A block plan of site, together with conditions and instructions, may be obtained on application. No premium is offered, but the author of the selected design will have the carrying out of the work at 5*l.* per cent. Mr. George H. Kite, town clerk and clerk to the borough education committee, Municipal Buildings, Taunton.

CONTRACTS OPEN.

BAGNALL.—Dec. 20.—For building a bridge at Blackwood Lane, Bagnall, Staffs., for the Leek Rural District Council. Mr. F. A. Bailey, Union Offices, Leek.

BINGLEY.—Dec. 12.—For the various works required in erection of a temperance hall and social institute in Bradford Road. Mr. Wm. Rhodes Nunns, M.S.A., architect and surveyor, Bank Chambers, Bingley, Yorks.

BIRMINGHAM.—Dec. 12.—For the enlargement of Smethwick Branch Post Office. Deposit 1*l.* 1*s.* The Postmaster at Smethwick Branch Post Office; H.M. Office of Works, Storey's Gate, London, S.W.

BISPHAM.—Dec. 12.—For supply of materials and the erection of the buildings and other works in connection with proposed electrical generating station in Red Bank Road, for the Bispham-with-Norbreck Urban District Council. Deposit 1*l.* 1*s.* Mr. T. Harrop, surveyor, Council Offices, Bispham, Lancs.

BOURNEMOUTH.—Dec. 16.—For erection of public conveniences in the Westover Gardens and on the west side of Fisherman's Walk. Deposit 1*l.* 1*s.* Mr. F. W. Lacey, M.I.C.E., borough engineer and surveyor, Municipal Offices, Bournemouth.

BOOTLE. Dec. 23. For erection and completion of wrought-iron railings and gates at the new cemetery. Mr. B. J. Wolfenden, A.M.I.C.E., borough engineer, Bootle, Lancs.

BRIGHTON.—Dec. 13.—For the rebuilding of No. 7 Gloucester Place. The Borough Surveyor, Town Hall, Brighton.

BROUGHTON.—Dec. 15.—For alteration of and addition to the girls' school, for the Thos. Dowse School Trust. The Thos. Dowse School Trust, The Rectory, Broughton, Stockbridge.

BURY.—Dec. 19.—For the setting back and rebuilding of the gable of Mount Sion House, Manchester Road. Mr. Arthur W. Bradley, M.I.C.E., borough engineer and surveyor, Municipal Offices, Bury, Lancs.

CARLISLE.—Dec. 19.—For the several works required in alterations, including the provision of new offices, at the Nisi Prius Court House. Mr. G. Dale Oliver, F.R.I.B.A., county architect, Carlisle.

CHELMSFORD.—Dec. 12.—For converting an existing room at the workhouse, Wood Street, into a padded room and an attendant's room, divided by a partition. Mr. Arthur S. Duffield, clerk, 96 High Street, Chelmsford.

CHORLEY (LANCS.).—Dec. 21.—For supply and fixing of steel girders, iron columns, rails, switches, hoists and other ironwork required for the alterations at the public slaughterhouses, for the Chorley Corporation. The Borough Surveyor's Office, Town Hall.

CLACTON-ON-SEA.—Dec. 14.—For the construction of a sea wall on the west beach, for the Urban District Council. Deposit 2*l.* 2*s.* Mr. D. J. Bowe, surveyor, Town Hall, Clacton-on-Sea.

DRIFFIELD.—Dec. 14.—For works required in the proposed extension and alterations to the infirmary, laundry and male bathing accommodation at the workhouse. Mr. Herbert Botterill, clerk to the Guardians, 23 Exchange Street, Great Driffield, Yorks.

DURHAM.—Dec. 13.—The Durham County Council invite sole tenders (1) for erection of a school at Trimdon Colliery for about 500 children (Mr. W. Rushworth, Shire Hall, Durham); (2) for alterations, &c., at Crook (Mr. N. Richley, Shire Hall, Durham).

GREAT HARWOOD.—Dec. 19.— For erection of St. John's Church, Great Harwood, Lancs. Messrs. Austin & Paley, architects, Lancaster.

GRIMSBY.—Dec. 14.—For extension to the free library, Victoria Street. Deposit 1*l.* 1*s.* Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer and surveyor, Municipal Buildings, 170 Victoria Street, Grimsby.

HALIFAX.—Dec. 15.—For various works required in erection of houses at Green Lane, West Vale. Mr. F. F. Beaumont, architect, Southgate Chambers, Halifax.

HALIFAX.—Dec. 15.—For the various works required in erecting doctor's residence, with motor house, &c., on the West Royd Estate, King Cross. Messrs. Medley, Hall & Son, architects, &c., 1 Harrison Road, Halifax.

HUDDERSFIELD.—Dec. 16.—For any or all of the various works required in erection of a detached residence in Sunny Bank Road, Edgerton. Messrs. John Kirk & Sons, architects, John William Street, Huddersfield.

ILFORD.—Dec. 19.—For erection of new telephone exchange. Deposit 1*l.* 1*s.* The Postmaster, Ilford Post Office, and H.M. Office of Works, Storey's Gate, London, S.W.

IRELAND.—Dec. 14.—For the erection of sixteen houses in the urban district of Trim. Deposit 1*l.* Mr. Francis Begin, B.E., Town Hall, Trim.

IRELAND.—Dec. 29.—For the reconstruction of the roof, &c., of their Londonderry terminus, for the Great Northern Railway Company (Ireland). Deposit 2*l.* Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

LONDON.—Dec. 12.—For repairs and painters' work to the exterior of the Whitfield Street Baths, for the St. Pancras Borough Council. Mr. C. H. F. Barrett, town clerk, Town Hall, Pancras Road, N.W.

LONDON.—Dec. 13.—For the erection of platform coverings at Paddington Goods Station, for the Great Western Railway Company. The Engineer, Paddington Station, W.

LONDON. Dec. 15.—For erection of proposed new room at the Guardians' Offices, Bancroft Road, E. Mr. Benjamin Catmur, clerk, Bancroft Road, Mile End, E.

LONDON.—Dec. 19.—For supply and erection of about 307 yards lineal of cleft pale fencing, 6 feet high, complete, to be erected along the southern and western boundaries of Queen's Wood, Highgate. Mr. E. J. Lovegrove, borough engineer and surveyor, Municipal Offices, Highgate, N.

MAIDENHEAD.—Dec. 12 —For alterations and repairs at the Council Infants' School, King Street. The Office of the Borough Surveyor, Guildhall, Maidenhead.

MARGATE.—Dec. 21.—For steel and ironwork for a large concert hall or pavilion and colonnade on the sea front, for the Corporation. Mr. Ernest A. Borg, borough engineer, 13 Grosvenor Place, Margate.

NEWBOTTLE.—Dec. 17.—For taking down and rebuilding part of the present buildings of the Newbottle and District Co-operative Society, Ltd. The Secretary of the Society, Back Lane, Newbottle, Northumberland.

NEWTON ABBOT.—Jan. 3.—For erection of additional wards at the infirmary. Deposit 2*l.* 2*s.* Mr. Samuel Segar, 24 and 26 Union Street, Newton Abbot, Devon.

PLYMOUTH.—Dec. 13.—For erection of stables, cart sheds, smithy and dwelling-house at Prince Rock. Deposit 2*l.* Mr. James Paton, borough engineer and surveyor, Municipal Offices, Plymouth.

SCOTLAND.—Dec. 13.—The Commissioners of H.M. Works and Public Buildings are prepared to receive separate tenders for the execution of:—(1) Excavator, mason and bricklayer works; (2) carpenter and joiner works; (3) ironfounder, smith, and ironmonger works; (4) slater work; (5) plasterer work; (6) plumber and gasfitter works; (7) painter, paperhanger, and gilder works; (8) glazier work; (9) blindmaker and bellhanger works in connection with ordinary works and repairs to buildings in their charge in (1) Edinburgh, (2) Glasgow, (3) Aberdeen, (4) Stirling, for three years from January 1 next. Mr. W. T. Oldrieve, H.M. Office of Works, Edinburgh.

SCOTLAND.—Dec. 24.—For mason, carpenter and plumber work repairs at the Duntulm House, Kilmuir. Mr. C. J. Reid, clerk of works, Uig, Skye; or Mr. W. G. Coles, Scottish Office, 122 George Street, Edinburgh.

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Skerne.—Dec. 21.—For alterations and additions to the house and buildings, and the erection of fences at the Grange Farm, Skerne, near Driffield, Yorks., for the Small Holdings and Allotments Committee. Mr. John Bickersteth, clerk, County Hall, Beverley.

South Shields.—Dec. 14.—For the enlargement of South Shields Post Office, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Postmaster of the South Shields Post Office, or H.M. Office of Works, Storey's Gate, London, S.W.

Sowerby Bridge.—Dec. 13.—For works required in extensions to a three-storey mill in Gratrix Lane. Messrs. Richard Horsfall & Son, architects and surveyors, 22A Commercial Street, Halifax.

Stonehouse.—Dec. 13.—For the erection of two small public conveniences. Send names by Dec. 13 to Mr. C. H. Trounce, surveyor, Town Hall. East Stonehouse, Devon.

Wales.—Dec. 12.—For erecting a pavilion at Aberporth, for the Pavilion Company. Secretary, Noyaddwen, Aberporth.

Wales.—Dec. 13.—For the enlargement of the telegraph office at Cardiff Station, for the Great Western Railway Company. The Engineer, Newport Station, Mon.

Wales.—Dec. 13.—For erection of three lock-up shops on their market premises at Market Street, Pontypool, for the Urban District Council. Deposit 1*l.* 1*s.* Mr. D. C. Udell, architect, Commercial Street, Pontypool.

Wales.—Dec. 20.—For erection of a police-court house at Ammanford, Carmarthenshire. Deposit 3*l.* 3*s.* Mr. W. Lionel Jenkins, A.M.I.C.E., P.A.S.I., county surveyor, (Eastern Division), Shire Hall, Llandilo.

Watford.—Dec. 20.—For the extension of Watford County Court, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Registrar, County Court Offices, Watford, and H.M. Office of Works, Storey's Gate, London, S.W.

Wimborne.—Jan. 1.—For erection of an elementary school at Redcotes, Wimborne, Dorset. The County Surveyor's Department, County Offices, Dorchester, and Messrs. Fletcher, Son & Brett, Wimborne.

TENDERS.

DOVER.

For supplying and constructing sewer and surface-water drains, &c., in the Folkestone Road district. Mr. W. C. Hawke, A.M.I.C.E., borough engineer.

Pearson & Son	£12,200 6 3
J. & T. Binns	11,939 11 3
Ford	11,607 0 0
Browning	10,300 0 0
Johnson & Langley	9,710 7 6
Muirhead & Co.	9,702 3 6
Denne	9,553 0 0
British Construction Co.	9,400 0 0
Crawford	9,367 4 9
Bell & Sons	9,342 17 4
Shellabear & Sons	9,300 0 0
Osenton	8,816 16 0
Higgins	8,651 0 0
Peerless Dennis	8,543 0 0
Wood & Sons	8,209 3 8
Paramors, Margate (*accepted*)	8,095 6 4

For supplying and constructing sewers and surface-water drain, &c., in the Tower Hamlets district. Mr. W. C. Hawke, A.M.I.C.E., borough engineer.

Pearson & Son	£4,947 18 2
Browning	4,496 0 0
Ford	4,415 0 0
J. & T. Binns	4,162 0 0
Denne	3,652 0 0
Shellabear & Sons	3,600 0 0
Muirhead & Co.	3,552 2 3
Bell & Sons	3,495 6 0
Crawford	3,272 15 0
Osenton	3,211 19 6
Paramors	3,067 13 3
Johnson & Langley	3,055 15 3
British Construction Co.	3,190 0 0
Higgins	2,959 0 0
Peerless Dennis	2,943 0 0
Wood & Sons, Crockenhill (*accepted*)	2,722 11 2

HELLESDON.

For additional water-closet accommodation at the Norwich City Lunatic Asylum. Mr. A. E. Collins, M.I.C.E., city engineer.

Palmer	£366 0 0
Hawes & Son	350 0 0
Hurn & Son	312 0 0
Smith	297 0 0
Watson & Kirby	294 0 0
Gill & Son	287 0 0
Hannant	278 0 0
Greengrass, Norwich (*recommended*)	267 0 0

HENBURY.

For alterations and extensions to the girls' and infants' schools. Mr. Maynard Froud, architect and surveyor, Bristol.

Williams & Sons	£718 10 0
Wren & Son	685 0 0
Wilkins & Sons	666 0 0
H. W. & E. I. Neale	662 10 0
Smith & Sons	659 17 10
Harris	656 2 7
Thomas & Sons	625 10 0
Perkins & Sons	618 0 0
Preece	610 0 0
Baker & Sons	607 0 0
Woodward	600 0 0
Hawkins	593 10 0
Moore	589 19 1
Colborne	573 5 6
Love	560 0 0
Lovell & Sons	559 16 0
Hunt	559 10 0
Bray	551 5 3
Hayes & Son	547 0 0
Chivers & Sons	538 0 0
Marsh & Stone	535 0 0
Heard	532 1 9
Walters & Son (*accepted*)	533 0 0
Architect's estimate	549 10 8

IRELAND.

For the construction of about 12,000 lineal yards of stoneware pipe sewer and contingent work at Stillorgan, for the Rathdown Rural District Council. Mr. P. H. M'Carthy, B.E., M.I.C.E.I., engineer, Dublin.

Hegarty & Gault	£16,036 5 3
Blake	15,305 0 0
Fitzpatrick	12,395 0 0
H. & J. Martin	12,160 0 0
Clarke	11,845 11 10
Martins	11,645 11 9
Grainger Bros.	11,562 17 7
J. & R. Thompson	11,395 0 0
Moran & Son	11,350 0 0
Fleming Bros.	10,862 0 0
Graham	10,625 11 1
J. & T. Binns, Dublin (*accepted*)	10,443 19 8

LONDON.

For the erection of a police-station at Deptford. Mr. J. Dixon Butler, F.R.I.B.A., architect, surveyor to the Metropolitan Police District, New Scotland Yard, S.W.

Holloway Bros.	£9,972 0 0
Adamson & Sons	9,876 0 0
Lathey Bros.	9,783 0 0
Holliday & Greenwood	9,771 0 0
Thomas & Edge	9,763 0 0
Minter	9,715 0 0
Prestige & Co.	9,692 0 0
Higgs & Hill	9,684 0 0
Patman & Fotheringham	9,643 0 0
Williams	9,577 0 0
Mowlem & Co.	9,563 0 0
Sabey & Son	9,528 0 0
Wallis & Sons	9,472 0 0
Grover & Son	9,442 0 0
Lovatt	9,420 0 0
Godson & Son	9,369 0 0
Blake	9,200 0 0
Lawrence & Son	9,182 0 0

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LONDON—*continued.*

For the installation of heating apparatus at No. 23 Belvedere Road, for the London County Council.

Burn Bros.	£1,184 0 0
J. & F. May	882 15 0
Wenham & Waters	875 0 0
Deane & Beal (*recommended*)	866 10 0
G. & E. Bradley	853 0 0
Architect's estimate	1,072 0 0

For the supply, delivery, and erection of eight penstocks and five dams for the southern low-level sewer No. 2, for the London County Council.

Cochrane	£4.235 0 0
Glenfield & Kennedy	3.930 0 0
Blakeborough & Sons	3.685 0 0
Markham & Co. (*recommended*)	3,233 0 0

For cleaning the interiors of London County Council schools.

Accepted tenders.

Garrett & Son—Surrey Lane school, Battersea	£240
Proctor & Sons—The "Chaucer" school, Bermondsey	351
Willmott—Somerford Street school, Bethnal Green, S.W.	358
Kazak—Mawbey Road school, Camberwell, N.	284
Triggs—The "Marlborough" school, Chelsea	321
Triggs—Park Walk school, Chelsea	254
Fenn—Canterbury Road school, Deptford	295
J. & C. Bowyer—Clyde Street school, Deptford	307
Orpin—Adys Road school, Dulwich	326
Stapleton & Sons—Central Street school, Finsbury, E.	221
Lole & Co.—North End Road school, Fulham	223
Bailey—Lombard Wall school, Greenwich	230
Garrett & Son—Brackenbury Road school, Hammersmith	293
Marchant & Hirst—Broomsleigh Street school, Hampstead	238
Stapleton & Sons—Grafton Road school, Islington, N.	290
Reason—Vittoria Place school, Islington, S.	259
Marchant & Hirst—Buckingham Street school, Islington, W.	312
King & Son—Church Street school, Kennington	226
King & Son—Upper Kennington Lane school, Kennington	262
Neal—Edinburgh Road school, Kensington, N.	299
Stokes & Sons—Thomas Street school, Limehouse	239
Chappell—Capland Street (senior) school, Marylebone, W.	275
Chappell—Stephen Street school, Marylebone, W.	235
Stokes & Sons—Glengall Road school, Poplar	244
Proctor & Sons—Fair Street school, Rotherhithe	273
Derby—The "Highway" school, St. George-in-the-East	259
Maxwell Bros.—Westmoreland Road school, Walworth	222

ORSETT.

For the supply of fire hydrants and hose at the Union House at Orsett, Essex. Mr. CHRISTOPHER M. SHINER, architect and surveyor, Duke Street, Adelphi, W.C., and Grays.

Simmonds & Co.	£72 0 0
Featherstone's Automatic Fire Co.	68 5 0
McGregor & Co.	67 10 0
Jacobson	60 0 0
Shand, Mason & Co.	58 12 9
Merryweathers & Sons	57 18 0
Brown Bros.	53 13 6
Reddaway & Co.	52 15 0
Rose Hose Co.	46 10 6
SANDERSON, Grays (*accepted*)	44 1 3

SCOTLAND.

For work in connection with the extension to Gallatown school, for the Dysart School Board.

Accepted tenders.

Fraser, mason	£1,089 0 0
Wishart, joiner	551 19 0
Blyth, plumber	169 3 1
Page, plasterer	120 12 6
Carron & Co., glazier	81 0 2
Currie, slater	79 6 1
Brown & Sons, tiler	66 10 8
Whitton, ironwork	42 11 10

SOUTH SHIELDS.

For the erection of offices, West Docks, for Messrs. J. Readhead & Sons, Ltd. Mr. J. H. MURTON, F.R.I.B.A., architect, South Shields.

Summerbell	£5,330 0 0
Robertson & Sons	5,300 0 0
Jennings	5,250 0 0
Thornton & Co.	5,225 0 0
J. & W. Lowry	5,198 0 0
Christie	5,153 0 0
Middlemiss Bros.	5,091 0 0
Ridley	5,047 0 0
Hall	5,028 0 0
Miller	4,998 0 0
D. & J. Ranken	4,990 0 0
Parkinson & Sons	4,985 0 0
Craven	4,981 0 0
Young	4,978 0 0
Lumsden	4,930 0 0
Haswell & Waugh	4,850 0 0
Carruthers	4,827 0 0
Sheriff & Sons	4,824 0 0
ALLISON, Whitburn (*accepted*)	4,795 0 0
Fenwick & Co.	4,570 0 0

TRURO.

For erection of a new mill (ferro-concrete and brick) at Malpas Road. Mr. ALFRED J. CORNELIUS, M.S.A., architect, Truro.

Hayes & Son	£3,700 0 0
Stanbury	3,170 0 0
Lovell & Son	3,167 0 0
Carkeek	3,162 0 0
Tozer & Son	3,027 4 0
Shellabear & Son	2,992 0 0
Reinforced Building Co.	2,932 0 0
Miners & Son	2,847. 0 0
Woodman & Son	2,811 0 0
Pethick Bros.	2,784 4 3
BENNETT, Bodmin (*accepted*)	2,560 15 0

WELLS.

For the erection of the Wells (Norfolk) International Stores. Messrs. GEORGE BAINES & SON, architects, 5 Clement's Inn, Strand, W.C.

Estimate A.

Eastoe	£427 0 0
Theobald & Sons	405 0 0
Carter & Wright	395 0 0
Coulson & Lofts	363 0 0
Redding & Son	349 0 0
Hawes & Sons	347 0 0
Youngs & Son	335 0 0
MAXEY & SON (*accepted*)	320 0 0
Gill & Son	319 0 0

Estimate B.

Coulson & Lofts	£63 0 0
Carter & Wright	51 0 0
Theobald & Sons	48 10 0
Eastoe	49 0 0
Hawes & Sons	43 0 0
Gill & Son	41 0 0
Youngs & Son	39 0 0
MAXEY & SON (*accepted*)	37 0 0
Redding & Son	30 0 0

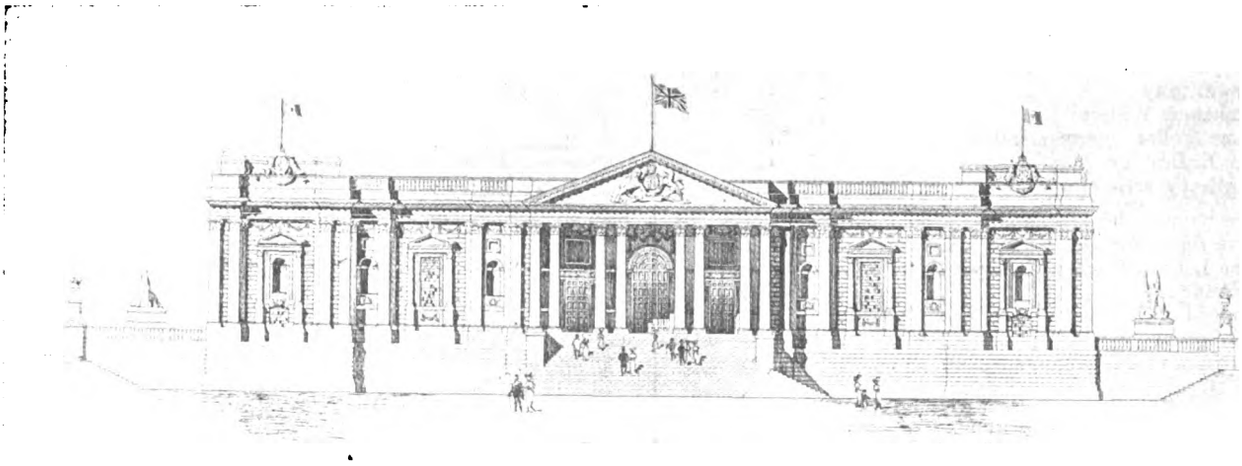
Estimate C.

Coulson & Lofts	£8 0 0
Hawes & Sons	6 14 0
Youngs & Son	6 0 0
Eastoe	5 10 0
Gill & Son	4 10 0
Carter & Wright	4 5 0
MAXEY & SON (*accepted*)	4 0 0
Redding & Son	3 10 0
Theobald & Sons	3 5 0

Estimate D.

Eastoe	£12 10 0
Maxey & Son	9 10 0
Redding & Son	8 10 0
Coulson & Lofts	6 17 6
Theobald & Sons	6 7 6
Hawes & Sons	6 6 0
Youngs & Son	6 0 0
Gill & Son	5 0 0

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THE BRITISH ART PALACE, INTERNATIONAL FINE ARTS EXHIBITION, ROME, 1911.
Mr. Edwin L. Lutyens, F.R.I.B.A., Architect.

WELLS—*continued.*

Estimate E.

Eastoe	£10 0 0
Youngs & Son	10 0 0
Hawes & Sons	10 0 0
Carter & Wright	7 10 0
Gill & Son	5 0 0

WALES.

For erection of a schoolroom in Glancynon Terrace, Abercynon, for the Tabernacle Welsh Calvinistic Methodist Church. Messrs. Morgan & Elford, architects, Mountain Ash.

Jones	£798 0 0
Morgan Bros.	630 0 0
Turner & Sons	598 0 0
Gibby & Cleak	495 0 0
Webb & Son	484 10 0
Evans & Richards, Abercynon (*accepted*)	465 11 6

For converting existing buildings at the Victoria Hall, Holyhead, to a small variety hall. Mr. J. Owen, F.R.I.B.A., architect, Holyhead.

Lansbury	£1,300 0 0
Roberts	1,254 7 9
Jones	1,230 15 0
R. & W. Williams, Holyhead (*accepted*)	1,219 10 0

WORKSOP.

For erection of ten pairs of cottages on land at the Co-operative Garden City, Kilton Road. Mr. E. Allsopp, architect, Worksop.

Wallhead Bros.	£4,850 0 0
Rowsell	4,230 0 0
Doncaster	4,215 10 0
Wright	4,090 0 0
McCarrick	4,065 0 0
Architect's estimate	4,032 10 0
Bowles & Son	4,020 0 0
Hemstalk	4,000 0 0
Ilett & Sons	3,999 0 0
Eastwood	3,950 0 0
Pepper, jun., Worksop (*accepted*)	3,950 0 0
Green	3,790 10 0

The Belfast Corporation adopted on the 1st inst. a scheme for extending the gasworks on the Ormeau Road, at a total outlay of 600,000*l.* The work is to be undertaken in sections, and the first or heaviest portion of that will take about five or six years to complete, at a cost of 250,000*l.*, or 50,000*l.* per annum.

The Surrey County Council give notice of their intention to erect the following schools:—Ewell, to accommodate 500 children; Cobham, for 200 children; enlargement of St. John's School, Woking, by 200 places, and West Byfleet for 100 children.

NEW SAVINGS BANK, MELBOURNE, AUSTRALIA.

We publish in this issue the front elevation and the two principal plans of this building, for which Messrs. Grainger & Little, of Melbourne, are the architects. Some few weeks ago the Commissioners of Savings Banks called for competitive designs, and the design of Messrs. Grainger & Little was awarded the first prize of 200*l.* among the fifty-three designs submitted. The Commissioners were assisted in their adjudication by Colonel Watson, the chief Government architect, and Mr. J. H. Marsden, who lately held that position.

A stipulation in the conditions of competition was that, provided the status of the author of the design awarded first prize was satisfactory, he should receive the commission to execute the work. An immediate start is about to be made to demolish the existing property on the site.

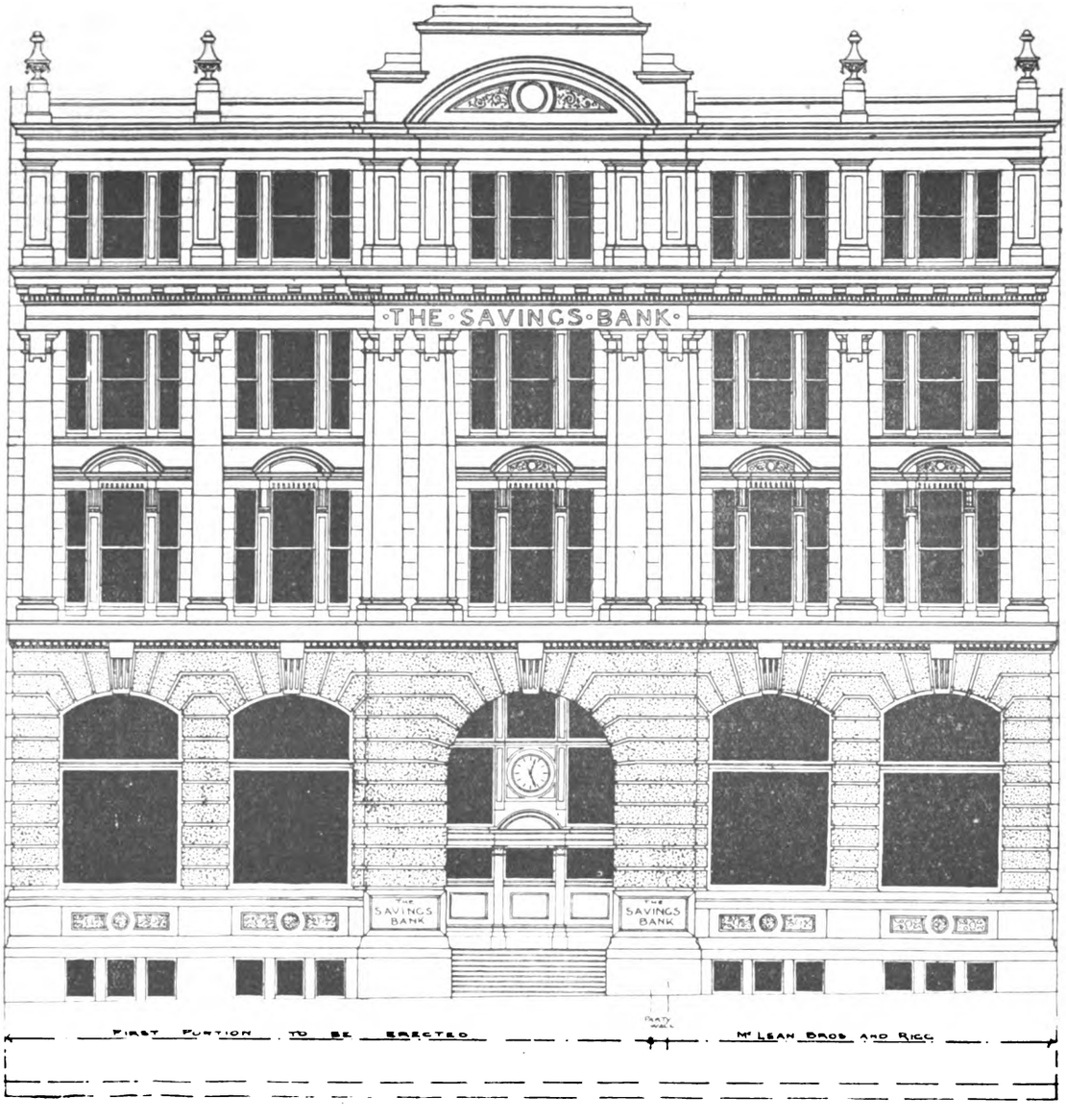
The buildings, which will cost 45,000*l.*, will have a frontage to Elizabeth Street of 103 feet 3 inches, occupying the site of McLean Bros. & Rigg, the Kalizoic, and the Small Arms Company, with a depth of about 87 feet to Butcher Lane. The ground floor will constitute an unbroken banking chamber, with a central entrance from Elizabeth Street, the elevators and staircases being arranged in three of the angles. By the arrangement of bank fittings, many thousands of customers will be dealt with daily. Unlike an ordinary banking chamber, the staff will occupy the centre of the chamber, and the customers the outside portions. The apartment will be about 28 feet high, well lighted and ventilated, and will be unique in its appointments. The board-room, inspector-general's room, and the principal officers will be housed on the first and second floors, while the correspondence, loans, and other large departments will occupy the third floor. The caretaker will occupy quarters in proximity with the flat roof. The comfort of the staff has been studied in every direction, and cloak, luncheon, and other rooms provided, while the flat roof will be used for recreation.

The basement will contain the four large strong rooms, containing an area of 2,107 feet, with store, waiting and retiring rooms.

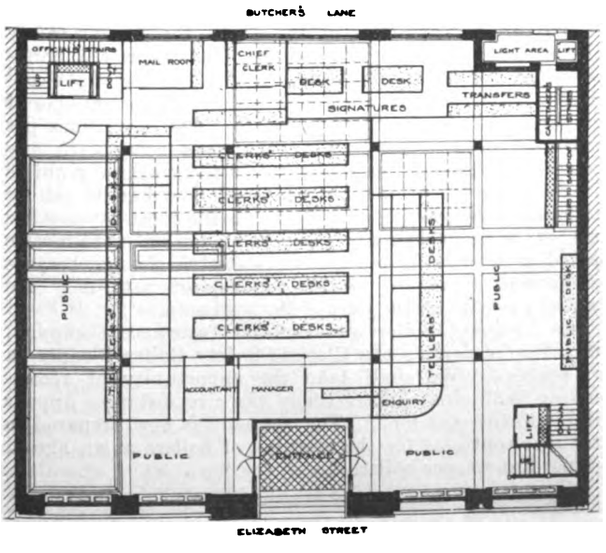
The elevation, which will be in the Italian Renaissance design of architecture, is bold in treatment, and will be carried out in polished granite for the banking chamber portion, with Stawell freestone above. Some of the outer walls will be of brickwork, while the remainder and all the floors will be executed in reinforced concrete and steel construction, rendering the building as fireproof as ingenuity can devise.

The successful designers, Messrs. Grainger & Little, Salisbury Buildings, Melbourne, have been associated with some of the largest architectural works carried out in Australasia, the additional buildings in connection with the Town Hall, Melbourne, won in competition, being but recently completed at a cost of 50,000*l.*

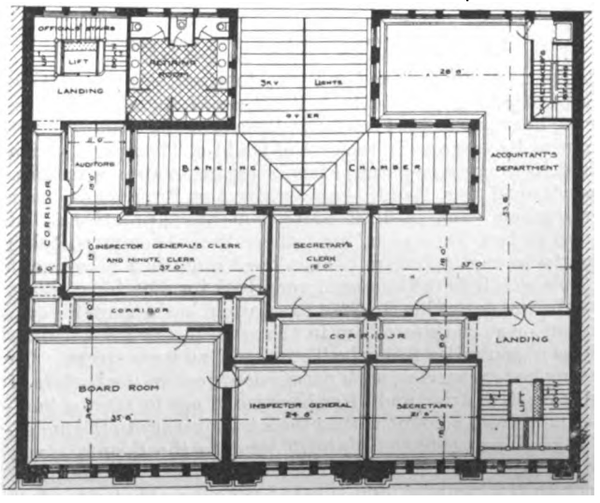
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THE SAVINGS BANK, MELBOURNE.—FRONT ELEVATION.—Messrs. GRAINGER & LITTLE, Architects.



SAVINGS BANK, MELBOURNE.—GROUND FLOOR.



SAVINGS BANK, MELBOURNE.—FIRST FLOOR.

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THE ROAD DEVELOPMENT ACT, 1909.

AT a meeting of the Society of Engineers (Incorporated), on Monday the 5th inst., a paper on "The Working of the Road Development Act, 1909," was read by Mr. Reginald Brown, A.M.I.C.E., F.S.I., M.Inst.M.&C.E., M.R.S.I., at Caxton Hall, Westminster.

The importance of good roads is, said Mr. Brown, of vital interest to everyone concerned in the best means of internal transport. Good roads make for prosperity.

The question of efficient means of approach to and from centres of population has been debated over and over again, but now that the "Road Development Act" has been placed on the Statute Book the highways of the country are to take their proper place in the scheme of internal development, and will have to be constructed of sufficient strength to carry heavy motor traffic.

Co-operation is needed, to bring matters to a successful issue, between Local Authorities, County Councils, and the Road Board.

The powers of the Road Board may be summarised under two headings:—(1) Improvement of existing roads; (2) making new roads.

In July last a circular was issued by the Road Board indicating the schemes which would receive first and most favourable consideration at its hands, suggesting that conferences should be held between the county surveyors and the surveyors throughout their respective counties to consider and put forward such schemes as in their opinion were urgent. Those schemes receiving the approval of the County Council would have most favourable consideration.

Main roads—where weak—should be reconstructed, and heavy motor traffic allowed to use those roads only.

Widening of existing roads—especially main and important district roads—are to have attention, but the author urges that in the case of Brentford High Street special Imperial assistance should be given. The author further suggests that each local authority should be prepared to bear 25 per cent. of the cost if the Road Board and County Council each contribute in the proportion of 25 per cent. and 50 per cent. respectively, and that the Road Board should advance money on loan to local authorities at a low rate of interest, the repayment being spread over as long a period as possible.

The author pointed out that to tar-macadamise the whole of the urban roads in England and Wales would cost very little more than at present if highway expenditure was equalised, but if this cannot be done then a contribution of 30,000*l.* per annum would ensure the provision of "Dustless roads" so far as urban main roads are concerned. Rural main roads at present need only be tar-dressed.

Opening out of dangerous corners and alteration of dangerous curves and gradients, strengthening and reconstruction of weak bridges, construction of new by-pass roads and construction of new main roads were also dealt with.

The author also suggested that all roads should be classified as under:—

First-class arterial streets—100 feet wide—all existing main roads contiguous to town areas.

Second-class arterial streets—80 feet wide—all subsidiary main roads, i.e., those not contiguous to town areas.

Third-class arterial streets—60 feet wide—all district main roads.

Fourth-class arterial streets—40-50 feet wide—all minor district roads.

AN ARCHITECT'S APPRENTICE.

MR. JUSTICE PHILLIMORE and Mr. Justice Coleridge, sitting as a Divisional Court of King's Bench on Wednesday, November 30, heard an appeal from a judgment of the County Court Judge at Bromsgrove in the case of Gadd *v.* Thompson, which raised an interesting point of law in regard to apprenticeship. The plaintiff, Mr. Gadd, is an architect at Bromsgrove, near Birmingham, and in 1902 he took as an apprentice a lad named Robert Thompson, his father, Wm. Thompson, being a party to the indenture. That deed contained a covenant under which Robert Thompson undertook for a period of years after he was out of his time not to set up in business on his own account or as clerk to others in the same profession within a radius of ten miles from the Town Hall at Bromsgrove. On leaving he took service, with permission, just on the borders of the restrictive area, and after he came of age he started business on his own account within the area contrary to the undertaking. Upon this the plaintiff went to the County Court for an injunction to restrain defendant from continuing to carry on the business, and the Judge holding that there had been a breach granted the injunction. From that judgment the defendant now appealed.

Mr. Wills, for the applicant, argued that as an infant the defendant could not enter into a covenant which would bind him after he came of age. It was not, he contended, a contract of service, but a contract of apprenticeship, which was only binding so long as the apprenticeship lasted, and that the County Court Judge could not therefore restrain him from carrying on the business.

Mr. Melward, for the respondent, contended that the apprenticeship deed was entered into with the consent of the father and mother, and that the covenant was part of the terms, without which the plaintiff would not have taken the lad to teach him the business. The County Court Judge had held that the covenant was quite reasonable under the circumstances.

Mr. Justice Phillimore held that there had been a breach sufficient to support the order for an injunction, and that the County Court Judge was therefore right. A contract of apprenticeship might be entered into in which the inducement to the master might be not only something to be done during the apprenticeship, but also something to be done after, and such a covenant could be enforced although entered into by a minor. The plaintiff's case was reasonable, and the County Court Judge was right. The appeal must be dismissed.

Mr. Justice Coleridge concurred.

The appeal was dismissed, with costs.

NOTTINGHAM ARCHITECTURAL SOCIETY.

AT the meeting of the Nottingham Architectural Society on Tuesday, December 6, Messrs. H. Beaverstock, G. M. Eaton, and W. L. B. Leech were elected associate members.

The President, R. Evans, Esq., Jun., informed the meeting that the Council were considering the question of fees for small works, and the cause of the increased cost of building generally, and would report to a future meeting.

After the business of the meeting had been concluded, Mr. A. Dale criticised the drawings submitted in the monthly competition of the Designing Club. The subject was Stable Buildings and a Coachman's Cottage. An interesting discussion took place among the members.

There is an increasing interest being shown in the Society, as shown by the number of members attending the meetings.

AN ELECTRIC BOILER CLEANER.

A DEMONSTRATION was given in London on Friday, the 2nd inst., at the Hotel Métropole, of an apparatus introduced by the Electric Safety Boiler Cleaner, Ltd., from the Continent, where it has proved a great success. Hitherto boilers have been cleaned by workmen entering the boilers, and hammering off piecemeal with hammer and chisel, or an automatic hammer, the deposit incrusted upon the plates. But it is generally admitted that it is impossible to thoroughly remove the incrustation by such methods so as to leave the boiler absolutely clean and smooth. A boiler could not be cleaned hitherto even in this indifferent way under ten days. It is now claimed to be possible to completely clean a Lancashire or any other boiler, tubular or otherwise, in from three to five days by the use of the electric safety boiler cleaner. The patent consists of an electric ½ horse-power motor which has attached to it a flexible shaft connected with a roller studded with chisel points, capable of revolving at a speed of from 1,500 to 4,000 revolutions per minute. The high speed of rotation does away with any labour on the part of the workman, as the machine requires only to be guided to the desired spot. The handle can be shortened or lengthened so as to reach the most inaccessible parts. It is claimed that it is impossible for boilers to become notched or indented by the use of the electric cleaner, because the machine thoroughly scales the deposit with only the slightest pressure on the part of the workman.

The National Boiler and General Insurance Company, Ltd., after inspecting the Electric Safety Boiler Cleaner in use, wrote:—"We shall take the opportunity of recommending it to our insurers where the circumstances appear suitable to the occasion." The company is now prepared to enter into contracts for the cleaning of boilers at an agreed sum per annum per boiler.

THE Gateshead Town Council propose to erect a Council school for about 350 children at Chapel Street.

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UNIVERSITY OF CALIFORNIA

THE LEANING TOWER OF PISA.*

IT is believed that the long-debated question as to the intentional construction, or accidental inclination, of the Leaning Tower of Pisa may be considered as positively determined in favour of the former theory by a series of 434 measurements, which were taken during the month of May 1910, in the interior of its spiral stairway.

These measures for the height of the stairway ceiling were taken with a sliding surveyor's rod and read from a vernier. In taking the measures the rod was held close to the wall, at right angles to the slope of the step and of the masonry courses above the step, at the centre of the outer side, and at the centre of the inner side of each step. As the centres of the sides of the steps, where the rod was placed, were fixed by the eye, some allowance must be made for surveyor's error in this particular. An allowance for this and all other errors, including those of the builders, may be estimated from the second diagram.

If we compare on fig. 1 the measures between the point G and the point I, we find the measure at G, for mean height of the ceiling to be 7.195 feet, and at I to be 7.225 feet. The difference is only 0.003 foot, or $\frac{3}{8}$ of an inch, in measures which are removed from one another by thirty-seven steps. In the entire number of thirty-seven steps the highest mean measure is 7.335 feet (192nd step) and the lowest is 7.16 feet (194th step). The difference is 0.175 foot, or $2\frac{1}{8}$ inches; $2\frac{1}{8}$ inches is therefore an extreme allowance for error of results, as to mean height of the ceiling from whatever possible cause, in these thirty-seven steps.

As regards the dip of the ceiling between the same points, the difference is only 0.04 foot, or $\frac{1}{2}$ inch (0.09-0.05). The maximum variation for dip in the thirty-seven steps is 0.32 foot, or $3\frac{3}{4}$ inches (dip inward, 0.20 foot at the 180th step, dip outward, 0.12 foot at the 155th step).

The extreme allowance for error of results in measures relating to dip in the given 37 steps is therefore $3\frac{3}{4}$ inches.

Proofs of an Intentional Leaning Construction.

We are now prepared to offer the proof that the Leaning Tower of Pisa was built to lean. In fig. 1 we shall find the variation in mean height on the line of greatest inclination, between the thirteenth step, F, and the forty-ninth step, H, to be 1.53 feet, or 1 foot 6 inches.

The increase in the dip of the ceiling between the same points is 0.70 foot, or $8\frac{1}{2}$ inches (0.73-0.03).

These comparisons are still more remarkable when made from the thirty-fourth step at I, which is three steps beyond the quarter-turn on the east side.

In sixteen steps, thirty-fourth to forty-ninth inclusive, the mean height of the ceiling rises 1.89 feet (9.075-7.185), or 1 foot $10\frac{3}{4}$ inches. The height of the inner wall rises 1.82 feet (8.71-6.89), or 1 foot 10 inches. The height of the outer wall rises 1.96 feet (9.44-7.48), or 1 foot $11\frac{1}{2}$ inches.

Of still greater interest than the total variations is the unbroken sequence of increment as regards the adjacent measures. The mean rise is obtained by the following mean increments, beginning at the thirty-fifth step as compared with the thirty-fourth:—0.11, 0.105, 0.095, 0.055, 0.11, 0.12, 0.21, 0.135, 0.08, 0.11, 0.11, 0.205, 0.11, 0.235, 0.10 foot. These rates of increment offer an indisputable proof that an average rate of increase in mean height of not less than 0.10 foot, or 0.11 foot, was definitely planned and carried out. Thus a total error in the height of the ceiling between the range of the 159th and 195th steps, where no system of change was at stake, might amount to $2\frac{1}{8}$ inches (including surveyor's error), but in the first storey a change between two adjacent measures of 0.10 foot was significant and part of a general plan and system. Not only that, even a change of 0.055 foot is significant of intention. The small increment of 0.055 foot at the thirty-eighth step, whether its small amount be due to the builder's error or to the surveyor's error, does not at all indicate an absence of the system which is being demonstrated. On the contrary, it is part of the proof of the existence of a system, and is an illustration of the general delicacy of the ratio of increase between adjacent steps, which produced the total increment in the mean height of the ceiling of 1.89 feet in sixteen steps.

The bearing of these measures on the question of purposed inclination is, of course, quite evident. If the ceiling is approximately 2 feet higher on the overhanging side, the weight of masonry on the overhanging side is diminished to that extent and the relative weight in the parts of the tower which do not overhang, as regards the exterior, is increased to that extent as regards the effect on the centre of gravity.

It is evident that up to the east quarter-turn at G a relatively low ceiling would add to the stability of the tower by increasing the weight of masonry on the side opposed to the exterior overhang.

The exterior width of a step is about 1.60 feet; the width of the stairway is about 3.61 feet. Thus an increase of 2 feet in height on the overhanging side would represent a decrease of weight on the overhanging side of $11\frac{1}{2}$ cubic feet of masonry above one step. An inspection of the individual measures will render similar computations possible for the steps preceding and following the forty-ninth, as far as the quarter-turns on both sides.

But there is an additional proof of a purposed leaning construction to be derived from an analysis of the measures for the inward dip of the ceiling.

At the thirteenth step (F, fig. 1) there is practically no dip and the inclination of the ceiling is normal to the step inclination. The measures show only 0.03 foot inward dip at the thirteenth step and only 0.03 foot outward dip at the fourteenth step. But at the forty-ninth step the inward dip is 0.73 foot, or 9 inches. The inclination of the forty-ninth step is about 0.34 foot, or 4 inches. Thus the ceiling is tilted inward at this point 5 inches below the true horizontal line in a width of about $3\frac{1}{2}$ feet.

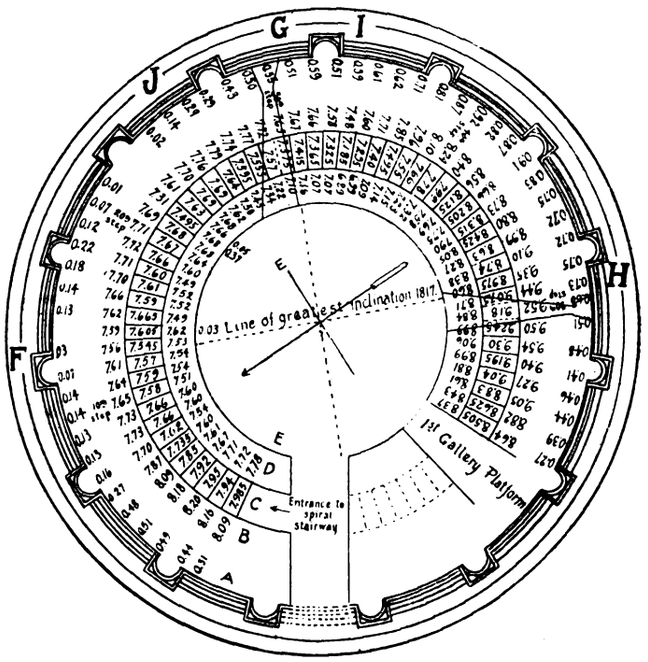


FIG. 1.—Brooklyn Museum measurements of 1910; for the heights of the spiral stairway between the ground floor and the first gallery platform. Measures in feet and decimals. A, B is the outer wall of the tower. The measures of Circle A represent the extra height of the outer wall of the spiral stairway as measured at the outside centre of each step and as compared with the inner wall. These measures consequently also represent the amount of downward dip of the stairway ceiling toward the inner wall. The measures of Circle B represent the height of the spiral stairway on the outer side as taken at the outer centre of each step. Circle C is the spiral stairway. The measures in this circle represent the average, or mean height, of the stairway at the middle centre of each step. These measures are obtained by halving the sum of the outer and inner measures. Circle D is the inner wall of the tower. The measures in this circle represent the inner height of the stairway at the inner centre of each step. In Circle E, beyond the line bounding the inner well of the tower, are the measures which represent the extra height of the inner wall of the stairway at the points where it is higher than the outer wall. They therefore also represent the relative dip downward and outward of the ceiling of the stairway when the heights of the inner and outer walls are compared at the given step.

This is obviously a constructive device to throw the weight of the solid wall above the ceiling toward the inner wall of the stairway and away from the exterior overhang.

During the construction of the first storey the dip was evidently considered a device of greater importance, or at least of more far-reaching effect, as regards the general stability of the tower, than the increase in the height of the stairway. The proof of this is that the sequence of increment in the inward dip on the east side begins considerably farther back than the beginning of the steady rise in the height of the ceiling. The uninterrupted increase of the dip begins at the twenty-fifth step, J, whereas the steady increase

* An article in *The American Architect* of November 23, entitled "Brooklyn Museum Measurements of 1910 in the Spiral Stairway of the Leaning Tower of Pisa," contributed by Mr. Wm. H. Goodyear, M.A., Curator of the Department of Fine Arts, Museum of the Brooklyn Institute; hon. member Society of Architects of Rome; hon. member Edinburgh Architectural Association; hon. member Royal Academy of Fine Arts of Milan; hon. academician Royal Academy of Venice; corresponding member American Institute of Architects.

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in the height of the ceiling begins at the thirty-fourth step, I. Thus the increase from 0.02-foot dip, at the twenty-fourth step, has already reached 0.55 foot at the quarter-turn G (in the space of six steps), and it is 0.73 foot at the forty-ninth step, H, with even higher occasional variations before that point. In fact, the maximum inward dip is very nearly 1 foot (0.95 foot at the 43rd step).

When we consider that the stairway is only about 3½ feet wide (3.61 feet in the first storey), it must be conceded that this inward dip of the ceiling is a very remarkable feature of the tower and a very conclusive proof of careful attention to the stability of a purposely leaning construction.

(To be continued.)

LICENTIATES AND THE R.I.B.A.

(COMMUNICATED.)

AT a meeting of architects held at Cardiff on the 5th inst., with Mr. Wilson, F.R.I.B.A., the President of the Cardiff, South Wales and Monmouthshire Society in the chair, Mr. A. W. S. Cross and Mr. George Hubbard, representing the Council of the R.I.B.A., addressed the assembly in explanation of the policy with regard to the formation of the new class of Licentiates of the Institute. This was the first of a series of meetings to be held in the provinces.

The proceedings, which were of a most successful nature, terminated in a hearty vote of thanks to the Council of the R.I.B.A. for the efforts it was making in the cause of the unification or registration of the profession. Almost every architect present who hitherto had remained unattached to any society filled up the application forms for Licentiates.

Already about 500 architects have been admitted as Licentiates or have been approved as such by the Council. There are, however, many hundreds of architects who still remain unattached to any society, and the facilities which are now offered of joining the Royal Institute should not be neglected.

Only twelve months, from March 23 last, are allowed to architects to join the Institute as Licentiates under the new bye-laws of the R.I.B.A. The Council is to be congratulated upon sending representatives into the provinces to explain the particulars of this class of membership, thus ensuring ample opportunity to the provincial architects to gain information at first hand before joining the Institute.

VARIETIES.

MR. REGINALD H. SPALDING, A.R.I.B.A., 36 and 37 King Street, Cheapside, E.C., and Watford, has taken into partnership Mr. Norman T. Myers, A.R.I.B.A., and the firm will now practise as Messrs. Spalding & Myers.

THE Society of Antiquaries of London have abandoned the project of excavating the site of Verulamium, as it has been found impossible to arrange terms for the excavation satisfactory to the Earl of Verulam.

HAMILTON School Board have decided to erect an elementary school on the site of the old Academy in Hope Street, the building to be equipped for instruction to supplementary classes. The estimated cost is about 10,000*l.* The Board have also agreed to enlarge Beckford Street School to provide accommodation for 330 additional pupils.

THE new premises of the Y.M.C.A. which are to be built on the site of the Longlands Hotel, St. Helens Road, Swansea, are to be in every way of the most convenient and up-to-date buildings. The plans have been prepared by Mr. Glendinning Moxham, F.R.I.B.A., Swansea, and we understand the building is to cost about 10,000*l.*

THE Kent education committee are informed that the following gross amounts have been approved in respect of the Secondary school estimates for the year 1910-11:—Ashford, 1,102*l.*; Beckenham, 2,692*l.*; Bromley, 2,442*l.*; Dartford, 1,916*l.*; Dover, 3,863*l.*; Erith, 2,883*l.*; Folkestone, 1,715*l.*; Gravesend, 2,681*l.*; Ramsgate, 3,140*l.*; Chatham, 1,265*l.*; Sitingbourne, 1,836*l.*; Tonbridge, 1,644*l.*; Tunbridge Wells, 1,832*l.*; total, 29,011*l.*

THE principal linings granted at the sitting of Glasgow Dean of Guild Court last week were:—Glasgow Corporation, to make additions to Ruchill Hospital and to Belvidere Hospital, and also to the Avenue Home buildings at the latter; Messrs. Fyfe & Fyfe, 61 St. George's Road, to convert the existing workshops into a theatre or concert hall; Messrs. Robertson & Gow, architects, 175 West George Street, to form streets and sewers and erect twelve tenements of dwelling houses at Mountainblue, Camlachie.

MR. ED. LEONARD, Local Government Board Inspector, held an inquiry last week respecting the application of the Gateshead Corporation for power to borrow 114,000*l.* for a new lunatic asylum at West Duddo. It is estimated that the total cost of the proposed asylum will be 140,000*l.*, and it is expected to have it completed in about three years. The estimated cost of furnishing was 50,000*l.* The plans have been approved by the Secretary of State and have been before the Local Government Board.

THE Saskatchewan Legislature has, according to the *Monetary Times*, authorised the Provincial Government to borrow a sum not exceeding $5,000,000 (about 1,030,000*l.*) for *inter alia* the following objects:—Erection of public buildings and execution of permanent improvements; erection and equipment of buildings for the University of Saskatchewan; construction and extension of telephone systems.

THE Dunfermline Corporation has given notice of its intention to promote a Provisional Order, having as its object an extension of the burgh boundaries to include Rosyth district, and to authorise the construction of a main drainage scheme for the existing burgh and the extended area. The engineers are Mr. W. R. Maxwell, burgh engineer, and Messrs. Crouch, Hogg & Easton, Glasgow, and the estimated cost is about 120,000*l.*

THE Glasgow Corporation considered last week a letter from the Building Trades Exchange calling attention to a practice which had of late been adopted to a certain extent in Glasgow, that of entrusting all branches of the work of a building contract to a single contractor, instead of adhering to the practice of giving the work to separate contractors for each department. The Exchange considered that the new departure was alike prejudicial to the building trade and to proprietors. It was more expensive to the proprietor, and the work done was less efficient, while proprietors and architects were not in direct communication with the person doing the work. They respectfully asked that in any building project undertaken by the Corporation they would issue separate schedules to each branch of the trade. On the motion of the Lord Provost, the letter was remitted to the Town Clerk with the instruction to bring it before any committee which might have building contracts in view.

TEN years ago timber in spite of its grand quality was a drug in British Columbia. A capitalist who built a railway on Vancouver Island received from the Province a considerable timber tract as a bonus on his enterprise. Though a shrewd man, he bewailed his lot in being thus saddled with such poor stuff. Not long since this very timber realised 800,000*l.* The denudation of the forests of the United States has proceeded at a gallop in the past quarter of a century. In the central State of Michigan less than twenty years ago timber held little commercial value, yet in fifteen years the forests have been cut down to bare stumps. In one year Michigan timber rose 12*s.* 6*d.* per 1,000 feet on the stump. The best-informed lumber men said that values must come back a bit, but they never dropped a penny. Up to 1897 in the Western State of Minnesota white and Norway pine was obtainable at 4*s.* to 8*s.* per 1,000 feet on the stump, i.e., uncut. Eleven years later no such wood could be had under 24*s.* to 48*s.* per 1,000 feet, and there was little forthcoming even at those prices. Twenty-four years ago timber in Michigan was only worth 1*s.* to 2*s.* per 1,000 feet on the stump, to-day such timber fetches 48*s.* to 60*s.* if any happens to be offering. There, as elsewhere in America, the few timber belts left are held by rich men for fancy prices.

TRADE NOTES.

WE understand that Chubb & Son's Lock and Safe Company, Ltd., have just received a warrant of appointment as patent lock and safe makers to His Majesty King George V.

RONUK, LTD., have been appointed sanitary polish manufacturers to His Majesty the King.

A LARGE clock is to be erected on the parish church, Ashingdon, Essex, as a memorial to King Edward VII. The order has been given to Messrs. John Smith & Sons, Midland Clock Works, Derby.

OWING to increasing business and the desirability of having all departments under one roof, Messrs. Fenning & Co., Ltd., marble and granite merchants, late of 3 Salters' Hall Court, E.C., have removed to more convenient premises at Palace Wharf, Rainville Road, Hammersmith, W. Their new telephone numbers are 816 and 817 Hammersmith.

WE have been requested to announce that Messrs. Norton & Gregory, Ltd., of Castle Lane, Buckingham Gate, London, S.W., have altered their telephone number from 716 Westminster to 715 Westminster, two lines.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

Special Position Spaces.—Unless ordered for weekly insertions the Proprietors cannot guarantee particular dates.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

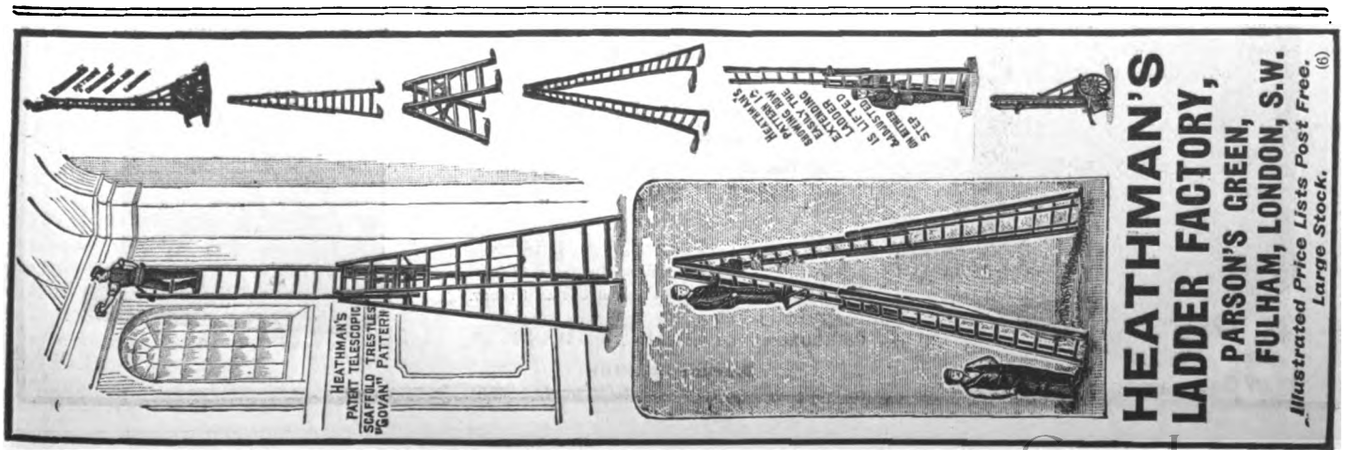
COMPETITIONS OPEN.

BRADFORD. The Board of Management of the Bradford Infirmary invite plans with estimates for a new infirmary in Duckworth Lane. Mr. Keith Young, F.R.I.B.A., will act as assessor. Deposit 3*l.* 3*s.*, which will be refunded on receipt of a *bona-fide* design or if block plan, instructions, &c., are returned within a month after receipt of replies to competitors' questions. The Secretary Superintendent of the Royal Infirmary, Bradford. (For further particulars see advertisement.)

COVENTRY.—March 1.—The Corporation contemplate the erection of municipal offices in the centre of the city, and also possibly a town hall, and accordingly invite competitive designs. Mr. E. Guy Dawber, F.R.I.B.A., will act as assessor. Deposit 2*l.* 2*s.*, which will be refunded on receipt of a bona-fide design or if the particulars are returned within fourteen days of receipt. Mr. Geo. Sutton, town clerk, 10 Hay Lane, Coventry. (For further particulars see advertisement, November 18.)

CUBA.—April 15.—An international competition has been arranged for a Presidential Palace to be erected at Havana at a cost of about 205,000*l.* Premiums of 10,000 pesos and 5,000 pesos will be awarded. Conditions may be seen at the Cuban Legation, 3 Grosvenor Mansions, Victoria Street, S.W., or the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C.

GLASGOW.—Jan. 31.—The Corporation invite plans of a proposed branch library at the corner of Saracen Street and Allander Street, Possilpark. Premiums of 50*l.*, 30*l.* and 25*l.*, will be awarded. A plan of the site and conditions may be obtained free from Mr. A. W. Myles, town clerk, City Chambers, Glasgow.

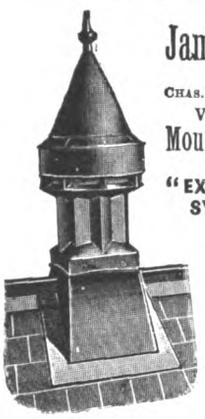


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LLANDRINDOD WELLS.—The Urban District Council invite competitive plans for a pavilion in the recreation ground. First and second premiums will be awarded by an assessor. Mr. D. C. Davies, clerk, Llandrindod Wells.

PENRITH.—Feb. 8.—The Governors of Queen Elizabeth's Grammar School, Penrith, are prepared to receive competitive designs for the erection of a secondary school, accommodating 200 students, with provision for the conduct of technical and evening classes. Premiums are offered to competing architects—viz., first, 50*l.*; second, 25*l.*; third, 10*l.* Printed instructions will be forwarded upon receipt of stamped addressed large-post official envelope. Mr. James Cropper, The Vicarage, Penrith, clerk to the Governors.

ROMFORD.—**The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911.** Class IV.—Town plan of Gidea Park—prizes of 100*l.* and 50*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs; Class IV., March 31, 1911. Mr. Michael Bunney, A.R.I.B.A., hon secretary, 33 Henrietta Street, Strand, W.C.

SOUTHPORT.—The Corporation invite architects practising in Southport to submit designs for a new public elementary school at Churchtown. Premiums of 50*l.*, 25*l.*, and 15*l.* will be paid to the authors of the first, second, and third successful designs. Full particulars, &c., may be obtained from Mr. J. Ernest Jarratt, town clerk, Town Hall, Southport.

TAUNTON.—Jan. 21.—The education committee invite architects, practising in the Borough of Taunton, to submit competitive designs for a provided school for 440 children. A block plan of site, together with conditions and instructions, may be obtained on application. No premium is offered, but the author of the selected design will have the carrying out of the work at 5*l.* per cent. Mr. George H. Kite, town clerk and clerk to the borough education committee, Municipal Buildings, Taunton.

CONTRACTS OPEN.

BAGNALL.—Dec. 20.—For building a bridge at Blackwood Lane, Bagnall, Staffs., for the Leek Rural District Council. Mr. F. A. Bailey, Union Offices, Leek.

BIRMINGHAM.—Dec. 17.—For supply and erection of a palm house in Cannon Hill Park. Mr. W. H. Morter, parks superintendent, Cannon Hill Park, Birmingham.

BOLTON-UPON-DEARNE.—Dec. 29.—The West Riding Small Holdings and Allotments Committee invite whole tenders for the following works:—New farmstead at Bolton-upon-Dearne (builder, carpenter and joiner, slater, plumber and glazier, plasterer and painter). The West Riding Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

BOOTLE.—Dec. 23.—For erection and completion of wrought-iron railings and gates at the new cemetery. Mr. B. J. Wolfenden, A.M.I.C.E., borough engineer, Bootle, Lancs.

BRIGHTON.—Dec. 20.—For the construction of a new glass and iron roof over the entrance hall at the Aquarium. The Borough Surveyor, Town Hall, Brighton.

BURY.—Dec. 19.—For the setting back and rebuilding of the gable of Mount Sion House, Manchester Road. Mr. Arthur W. Bradley, M.I.C.E., borough engineer and surveyor, Municipal Offices, Bury, Lancs.

CAMBORNE.—Dec. 19.—For erection of public hall and shops, including alterations to existing premises. Mr. H. Burrow, secretary, Town Hall Buildings Co., Ltd., Camborne, Cornwall; or Mr. Sampson Hill, architect, Green Lane, Redruth.

CANTLOP.—Jan. 6.—For the following works at Cantlop, five and a half miles from Shrewsbury, about two miles from Berrington Station, G.W.R., and about two miles from Condover Station, G.W. and L. & N.W. Railway, viz.:—(1) One new cottage; (2) five sets of new farm buildings; (3) alterations, additions and repairs to two existing homesteads; (4) alterations, additions and repairs to three existing cottages, for the Salop County Council. Mr. Wm. T. Hall, agent, College Hill, Shrewsbury.

CARLISLE.—Dec. 19.—For the several works required in alterations, including the provision of new offices, at the Nisi Prius Court House. Mr. G. Dale Oliver, F.R.I.B.A., county architect, Carlisle.

CHORLEY (LANCS.).—Dec. 21.—For supply and fixing of steel girders, iron columns, rails, switches, hoists and other ironwork required for the alterations at the public slaughter-houses, for the Chorley Corporation. The Borough Surveyor's Office, Town Hall.

DEWSBURY.—Dec. 19.—For erection of a residence in Savile Road, Savile Town. Messrs. Barton & Son, architects and surveyors, Halifax Road, Dewsbury.

FAREHAM (HANTS.).—Dec. 28.—For erection of a drill hall, offices, drainage, fencing, &c., at Fareham, Hants, for the occupation of the Wessex (Hampshire) Royal Garrison Artillery. Deposit 3*l.* Mr. Wilberforce Cobbett, C.E., Fareham, Hants.

GRAVESEND.—Dec. 17.—For the following works, for the Town Council, viz. alterations to the present treasurer's and surveyor's offices. The Borough Surveyor's Office, Town Hall, Gravesend.

GREAT HARWOOD.—Dec. 19.— For erection of St. John's Church, Great Harwood, Lancs. Messrs. Austin & Paley, architects, Lancaster.

HARWICH.—Dec. 20.—For erection of screens, alterations and additions to several of the elementary schools in the borough, also for the heating by hot-water apparatus of the Esplanade boys' and infants' schools, for the Harwich Education Committee. Mr. G. D. Hugh-Jones, secretary, Church Street, Harwich.

HANDSWORTH.—Jan. 5.—The West Riding Education Committee invite whole or separate tenders for the erection of boundary wall (builder) at Handsworth Council School. The Education Architect, County Hall, Wakefield.

HAVERTHWAITE.—Dec. 31.—For alterations to the Old School House at Brow Edge. The Backbarrow Co-operative Stores, Lancs.

HULL.—Dec. 30.—For erection of new training college, Cottingham Road, including the college block, hostels for men and women students, principal's residence, gate lodge and entrance gates, fencing, drainage, roads, earthwork, &c., for the Education Committee. (Messrs. Crouch, Butler & Savage, architects, Birmingham.) Send names, together with a deposit of 5*l.* 5*s.* to the City Treasurer, Town Hall, Hull.

HUNSLET (LEEDS).—Dec. 22.—For the execution of alterations and additions (whole tenders) at the Union Offices. Mr. W. E. Richardson, architect, Rothwell, Leeds.

ILFORD.—Dec. 19.—For erection of new telephone exchange. Deposit 1*l.* 1*s.* The Postmaster, Ilford Post Office, and H.M. Office of Works, Storey's Gate, London, S.W.

IRELAND.—Dec. 29.—For the reconstruction of the roof, &c., of their Londonderry terminus, for the Great Northern Railway Company (Ireland). Deposit 2*l.* Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

IRELAND.—Dec. 31.—For erection and completion of a manse adjoining Ballee Unitarian Church, near Downpatrick. Messrs. Hobart & Heron, architects, Scottish Provident Buildings, Belfast.

ISLE OF WIGHT.—Dec. 31.—The Board of Trade invite tenders for erection of a rocket life-saving apparatus house at Blackgang. The Coastguard Station, Blackgang.

KINGSTON-BY-SEA.—Dec. 17.—For erection of two small shelters for consumptive patients at Kingston-by-Sea, Sussex, for the Guardians of Steyning Union. Send names and 10*s.* 6*d.* deposit by Dec. 16 to Mr. Arthur Flowers, clerk, Union Offices, Shoreham-by-Sea.

LEPTON.—Dec. 21.—For erection of four dwelling-houses in Highgate Lane, Lepton, Huddersfield. Mr. J. Berry, architect and surveyor, 3 Market Place, Huddersfield.

LINCOLNSHIRE.—Jan. 12.—For the following works, for the Lindsey County Council (Education Committee), viz.:—(1) Completion of elementary school at Crosby; (2) making certain alterations and additions to the Council elementary school at Grainthorpe; (3) addition of a classroom to the infants' department of the elementary school at Bursar Street, Cleethorpes; (4) erection of a new master's house at West Butterwick; and (5) erection of a new Council school at Ulceby, near Alford. Deposit 2*l.* 2*s.* No. 1; 1*l.* 1*s.* for the rest. Send names by Dec. 31 to Messrs. Scorer & Gamble, architects, Bank Street Chambers, Lincoln.

LONDON.—Dec. 19.—For supply and erection of about 307 yards lineal of cleft pale fencing, 6 feet high, complete, to be erected along the southern and western boundaries of Queen's Wood, Highgate. Mr. E. J. Lovegrove, borough engineer and surveyor, Municipal Offices, Highgate, N.

LONDON.—Dec. 22.—For alterations and additions to Mount Pleasant Parcel Office, E.C. Mr. J. Rutherford, 22 Carlisle Place, S.W.

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Manchester.—Dec. 31.—For alterations and additions to the municipal school in Cavendish Road, Withington. Deposit 1*l.* 1*s.* The Education Offices, Deansgate, Manchester.

Margate.—Dec. 21.—For steel and ironwork for a large concert hall or pavilion and colonnade on the sea front, for the Corporation. Mr. Ernest A. Borg, borough engineer, 13 Grosvenor Place, Margate.

Marsden.—Dec. 21.—For erection of three dwelling-houses and a branch store (mason's work excepted) at Smithy Holme, Marsden, Yorks. Mr. J. Berry, architect and surveyor, 3 Market Place, Huddersfield.

Mexboro'.—Dec. 31.—For erection of a Wesleyan Methodist chapel adjoining the present school chapel. Mr. A. Brocklehurst, Palatine Bank Buildings, Norfolk Street, Manchester.

Mickleton.—For the erection of four cottages, for the Campden Rural District Council. Mr. C. J. Gander, surveyor, Norton House, Shipston-on-Stour.

Milnsbridge.—Dec. 20.—For various works required in erection of a dyehouse, &c., at George Street Mills, Milnsbridge, Yorks. Messrs. J. B. Abbey & Son, architects and surveyors, 34A New Street, Huddersfield.

Newton Abbot.—Jan. 3.—For erection of additional wards at the infirmary. Deposit 2*l.* 2*s.* Mr. Samuel Segar, 24 and 26 Union Street, Newton Abbot, Devon.

Patcham.—Dec. 17.—For erection of a mortuary in the Waterhall Road, Patcham, near Brighton, for the Steyning East Rural District Council. Send names and 10*s.* 6*d.* deposit to Mr. Arthur Flowers, clerk, Union Offices, Shoreham-by-Sea, Sussex.

Ramsden Bellhouse.—Dec. 19.—For the construction of two small raised timber pathways, one at Castledon Road, Downham, and the other at Church Road, Ramsden Bellhouse, for the Billericay Rural District Council. Mr. R. J. W. Layland, surveyor, High Street, Billericay, Essex.

Scotland.—Dec. 20.—For the mason, carpenter and slater works of restoration of part of Farm Steading, Upperthird, Auchterless, Aberdeen. Mr. W. L. Duncan, architect, Turriff.

Scotland.—Dec. 24.—For mason, carpenter and plumber work repairs at the Duntulm House, Kilmuir. Mr. C. J. Reid, clerk of works, Uig, Skye; or Mr. W. G. Coles, Scottish Office, 122 George Street, Edinburgh.

Sheffield.—Dec. 30.—For the supply, delivery and erection of materials for extensions to the Neepsend Power House, comprising extension of the engine room, boiler house and coal store, new pump room, turbine and boiler foundations, &c. Deposit 2*l.* 2*s.* Mr. S. E. Fedden, general manager and engineer, the Corporation Electric Supply Department, Commercial Street, Sheffield.

Skerne.—Dec. 21.—For alterations and additions to the house and buildings, and the erection of fences at the Grange Farm, Skerne, near Driffield, Yorks., for the Small Holdings and Allotments Committee. Mr. John Bickersteth, clerk, County Hall, Beverley.

Stroud.—Jan. 7.—For erection of a new high school for girls, for the Governors of the Stroud Educational Foundation. Send names and 2*l.* 2*s.* deposit by Dec. 20 to Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

Wales.—Dec. 20.—For erection of a police-court house at Ammanford, Carmarthenshire. Deposit 3*l.* 3*s.* Mr. W. Lionel Jenkins, A.M.I.C.E., P.A.S.I., county surveyor, (Eastern Division), Shire Hall, Llandilo.

Wales.—Dec. 21.—For erection of proposed house and surgery, for the Trustees of the Rhymney Workmen's Doctors Fund. Mr. Evan Pugh, secretary, Price Street, Rhymney.

Wales.—Dec. 21.—For erection of drill hall and instructor's quarters at Aberbargoed, for the 1st Battalion Monmouthshire Regiment. Deposit 1*l.* 1*s.* Messrs. Habershon, Fawckner & Co., F.R.I.B.A., 41 High Street, Newport, Mon.

Wales.—Dec. 21.—For erection of a public convenience in Llandaff Fields, for the Cardiff Corporation. The City Engineer's Office, City Hall, Cardiff.

Wales.—Dec. 24.—For proposed erection of twenty-five attached and thirty semi-detached cottages at Kenfig Hill, for the Aberbaiden Building Club. Mr. A. H. Jenkins, architect and surveyor, Blackmill.

Watford.—Dec. 20.—For the extension of Watford County Court, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* The Registrar, County Court Offices, Watford, and H.M. Office of Works, Storey's Gate, London, S.W.

Wimborne.—Jan. 1.—For erection of an elementary school at Redcotes, Wimborne, Dorset. The County Surveyor's Department, County Offices, Dorchester, and Messrs. Fletcher, Son & Brett, Wimborne.

York.—Jan. 9.—For the erection of new stores in Railway Street, for the York Equitable Industrial Society, Ltd. Deposit 2*l.* 2*s.* Mr. H. B. Beck, 28 High Street, Doncaster.

TENDERS.

CAMBRIDGE.

For alterations and additions to the Ancient Druid Inn, Fitzroy Street, Cambridge, for Messrs. Charles Wells, Ltd., Horne Lane Brewery Bedford. Mr. Thomas Cockrill, architect, 8 Bank Buildings, Bedford, and Biggleswade.

Kidman Bros.	£398 0 0
Bartle & Son	395 0 0
Wrycroft & Sons	375 0 0
Brignall	366 0 0
Rooke, Cambridge (*accepted*)	318 0 0

GUILDFORD.

For (*a*) small alterations and additions to the Board Room; (*b*) lighting for the Guardians. Mr. E. L. Lunn, architect, Guildford.

	(a)	(b)
Smith, Guildford	£430 0 0	£11 10 0
Stanley Ellis, Guildford	405 0 0	30 0 0
Tribe & Robinson, Guildford	390 0 0	27 0 0
Swayne & Son, Guildford	354 0 0	21 0 0
Drowley & Co., Woking	349 0 0	25 0 0
Mitchell Bros., Shalford	333 0 0	30 0 0
Wallis, Woking	312 0 0	20 10 6
Brand, Guildford (*accepted*)	295 0 0	11 16 0
Rutter & Gibson, Shalford	285 0 0	25 0 0

LONDON.

For the erection of a new Section House at Hunter Street, King's Cross. Mr. J. Dixon Butler, F.R.I.B.A., architect, Surveyor to the Metropolitan Police District. New Scotland Yard, S.W.

Holloway Bros. (London), Ltd.	£10,300 0 0
F. & H. F. Higgs	9,980 0 0
Minter	9,950 0 0
Killby & Gayford, Ltd.	9,934 0 0
Perry & Co. (Bow), Ltd.	9,878 0 0
Blake	9,850 0 0
Holland & Hannen	9,789 0 0
Wallis & Sons, Ltd.	9,779 0 0
Patman & Fotheringham, Ltd.	9,723 0 0
Prestige & Co., Ltd.	9,714 0 0
Higgs & Hill, Ltd.	9,680 0 0
Holliday & Greenwood, Ltd.	9,595 0 0
Sabey & Sons, Ltd.	9,533 0 0
Lole & Co.	9,491 0 0
Mowlem & Co.	9,490 0 0
Kearley	9,484 0 0
Godson & Sons	9,425 0 0
Lovatt, Ltd.	9,347 0 0
Fairhead & Son	9,292 0 0
Grover & Son	9,037 0 0

For the supply and delivery of 5,000 tons of track rails and fastenings and about 700 tons of conductor rails, required in connection with the construction or reconstruction of further lines included in the programme of tramway works for 1910-11, and also for maintenance purposes, for the L.C.C.

Track rails and fastenings.

Dick, Kerr & Co.	£40,035 0 0
The North-Eastern Steel Co.	38,150 0 0
Barrow Hæmatite Steel Co.	37,450 0 0
P. & W. Maclellan	37,325 0 0
Bolckow, Vaughan & Co.	36,900 0 0
Walter Scott, Ltd., Leeds (*recommended*)	32,855 0 0
Batt & Co.	32,045 0 0
Cammell, Laird & Co.	Incomplete tender.
Chief Engineer's estimate	35,650 0 0

Conductor rails.

Steel, Peach & Tozer	£7,587 10 0
The North-Eastern Steel Co.	7,325 0 0
P. & W. Maclellan	7,202 10 0
Walter Scott	7,027 10 0
Frodingham Iron and Steel Co., Scunthorpe (*recommended*)	6,913 15 0
Chief Engineer's estimate	7,088 15 0

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LONDON—*continued.*

For alterations, painting, and decorations for variety theatre, Pitfield Street, Hoxton. Messrs FULLER, HORSEY, SONS & CASSELL, architects.

Higgs & Hill	£2,984 0 0
McCormick & Sons	2,888 0 0
Fryer & Co.	2,442 6 9
Price	2,357 0 0
Jerram	2,022 0 0
F. & F. J. Wood	1,920 0 0
Hawkey & Oldman	1,812 0 0

For the alterations at Holloway police station. Mr. J. DIXON BUTLER, F.R.I.B.A., architect and surveyor to the Metropolitan Police District, New Scotland Yard, S.W.

Holland & Hannen	£5,360 0 0
Higgs & Hill	5,279 0 0
Newby & Bros.	5,275 0 0
Eyre	5,200 0 0
Patman & Fotheringham	5,183 0 0
Perry & Co.	5,159 0 0
McCormick & Sons	5,088 0 0
Willmott & Sons	4,994 0 0
Grover & Sons	4,979 0 0
Wallis & Sons	4,978 0 0
Godson & Sons	4,972 0 0
Moss & Sons	4,912 0 0

For the supply of the overhead electrical equipment required in connection with the construction of the authorised tramways from Putney Bridge to High Street, Wandsworth, for the L.C.C.

Dick, Kerr & Co.	£2,257 14 6
British Insulated and Helsby Cables	2,222 5 0
Clough, Smith & Co., Ltd., South Place, E.C. (*recommended*)	2,015 14 3
Estimate of the Chief Officer of Tramways	2,300 0 0

For the supply of ash dust removing plant for the Greenwich generating station, for the L.C.C.

	First Section.	Complete Plant.
Buffalo Forge Co.	£830 0 0	£4,118 10 0
Matthews & Yates	865 0 0	3,990 18 0
Spencer & Co.	1,184 12 0	3,888 9 0
Shelby Manufacturing Co.	867 15 3	3,805 16 0
Jas. Keith & Blackman Co., Farringdon Avenue, E.C. (*recommended*)	690 1 6	3,507 5 6
Estimate of the Chief Officer of Tramways		3,000 0 0

For erection of fifty cottages on Mitcham Lane Estate, S.W. Messrs. BIGNOLD & IDLE, architects, 242 Lavender Hill, S.W.

Houses marked A.

Cook	£8,760 0 0
Snook & Co.	8,604 0 0
Purser & Gratwick	8,340 0 0
Monk	8,073 0 0
Woollaston Bros.	7,542 0 0
Fraser	7,260 0 0
Dolman & Backhirst	7,110 0 0

Houses marked B.

Snook & Co.	8,173 10 0
Cook	7,308 0 0
Purser & Gratwick	7,299 0 0
Fraser	7,134 0 0
Monk	6,831 0 0
Woollaston Bros.	6,069 0 0
Dolman & Backhirst	6,060 0 0

PORTHCAWL.

For private street improvement works in Lias Road and Church Place. Mr. ARTHUR S. LILLEY, A.M.Inst.C.E., council's surveyor.

Thompson	£971 10 7
Jones	897 11 7
Scott	883 7 0
Rees Jones	817 8 9
Walters	802 9 6
Thomas	796 4 9
Walker	791 11 3
Pomeroy	783 15 5
Pye, Parkinson & Co.	761 17 11
Collins & Co.	745 4 3
RANKIN, Porthcawl (*accepted*)	679 2 1
Surveyor's estimate	793 14 3

WALES.

For the construction of a post-mortem house and mortuary near the Dolau Subway, Llanelly. The Surveyor, Llanelly.

T. Williams	£192 0 0
Jones	178 0 0
Phillips	175 0 0
J. Williams	170 0 0
Gower & Hipkiss	160 0 0
Howell & Son	156 0 0
MERCER, Llanelly (*accepted*)	155 0 0

WEMBLEY.

For the making-up of Clayton Avenue and Westbury Road. Mr. CECIL R. W. CHAPMAN, surveyor, Wembley.

Clayton Avenue.

Dunmore	£2,185 18 6
Halsey & Son	1,591 17 5
Starkey	1,574 11 5
Adams	1,567 10 0
Wright	1,540 6 8
Elliot & Co.	1,514 19 1
Jaggard	1,493 0 0
Wooster	1,469 7 2
Thomson & Co.	1,464 15 8
Fitzgerald	1,425 14 4
Free & Sons	1,422 0 9
Brummell	1,392 8 0
WILLIS & POWIS, Wembley (*accepted*)	1,349 17 7
Gibbons	1,344 19 9

Westbury Road.

Dunmore	1,570 8 10
Wright	1,199 18 1
Halsey & Son	1,176 18 4
Starkey	1,161 15 3
Adams	1,145 9 3
Elliot & Co.	1,093 3 10
Jaggard	1,084 0 0
Wooster	1,074 3 4
Free & Sons	1,044 6 8
Fitzgerald	1,033 10 2
Brummell	1,012 14 2
Gibbons	985 10 2
WILLIS & POWIS, Wembley (*accepted*)	966 4 10
Thomson & Co.	930 18 2

TRADE NOTES.

GEDLING schools, near Nottingham, are being supplied with Shorland's patent Manchester grates by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

MESSRS. ALDOUS & CAMPBELL, LTD., lift and crane makers and repairers, of Lower Bland Street, London, S.E., are issuing a catalogue in the form of blotting-pads—a useful form of advertisement to the recipient.

MESSRS. GEORGE JENNINGS, LTD., Lambeth Palace Road, S.E., have been honoured by the receipt of a Royal Warrant appointing them sanitary engineers to His Majesty King George V. Messrs. Jennings, Ltd., held the warrant of appointment in the same capacity to His late Majesty King Edward VII.

THE principal contract in connection with the new water supply for Fraserburgh has been let to Mr. James Kinniburgh, public works contractor, Glasgow, at a price of 40,000*l*. It is to be completed within one year.

MESSRS. WEATHERALL & GREEN, surveyors and auctioneers, Chancery Lane, W., have taken into partnership Mr. Sydney A. Smith, F.S.I., who has acted for fifteen years as principal surveying assistant. The style of the firm will be unaltered, remaining as for the past half-century.

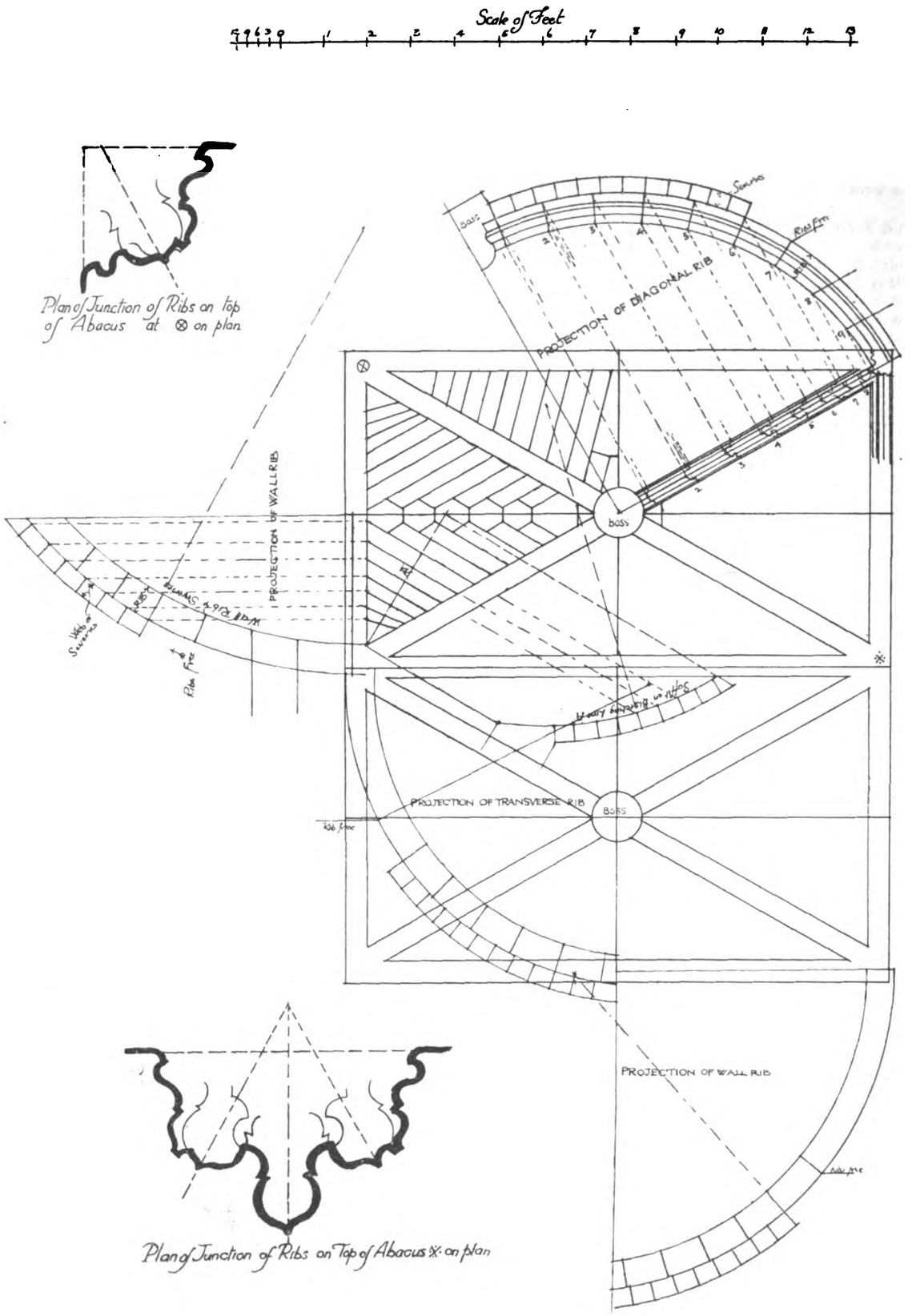
THE annual general meeting of the Northern Counties Federation of Building Trade Employers was held at Stockton last week, when Mr. Fred W. Ranken (Sunderland) was elected president. The father of Mr. Ranken was one of the founders and first president of the Federation. Mr. John Proud (West Hartlepool) was elected senior vice-president; Mr. W. T. Weir (Howdon-on-Tyne), junior vice-president; Mr. John W. White (Sunderland) was re-elected honorary treasurer. The various committees were also elected.

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"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

SOUTH PORCH OF ST PETER'S CHURCH HOWDEN YORKSH

Detail Plan and Sections showing developement of Vault



MEASURED AND DRAWN BY "LOIDIS."

A BAY OF VAULTING FROM THE SOUTH PORCH OF ST. PETER'S CHURCH, HOWDEN.

THE vaulted ceiling of the south porch to Howden Church is a splendid example of fourteenth-century vaulting. The vault is in two bays, with moulded transverse, diagonal and wall ribs, all beautifully and scientifically jointed. The diagonal ribs describe a perfect semicircle, the wall and transverse ribs being pointed. At the intersection of the ribs are a couple of finely carved stone bosses. The vault severies are filled with finely jointed masonry in thin

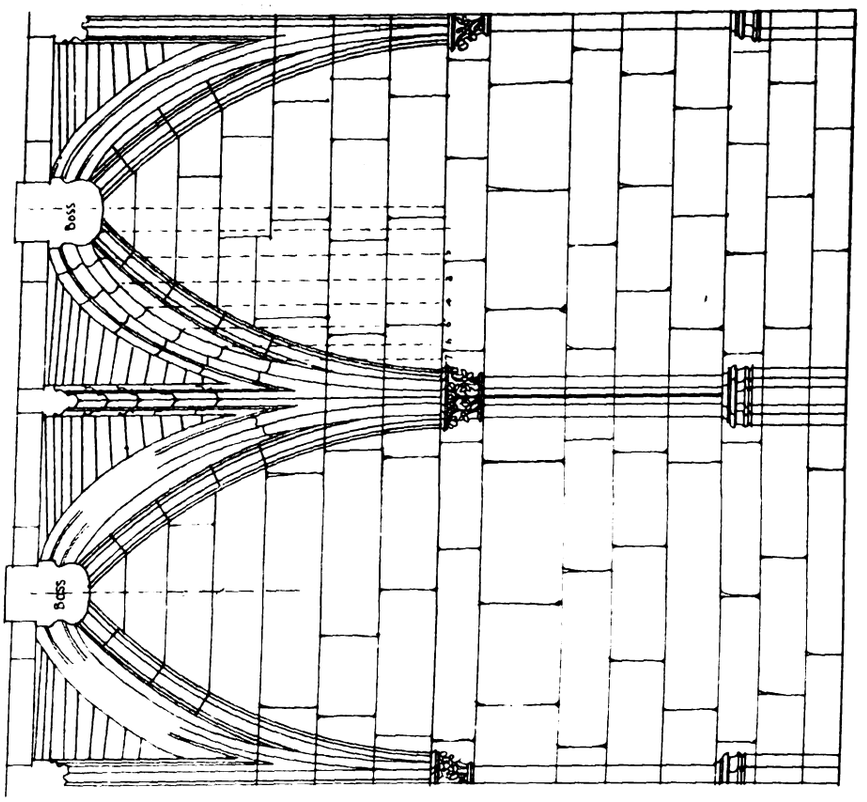
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UNIVERSITY OF CALIFORNIA

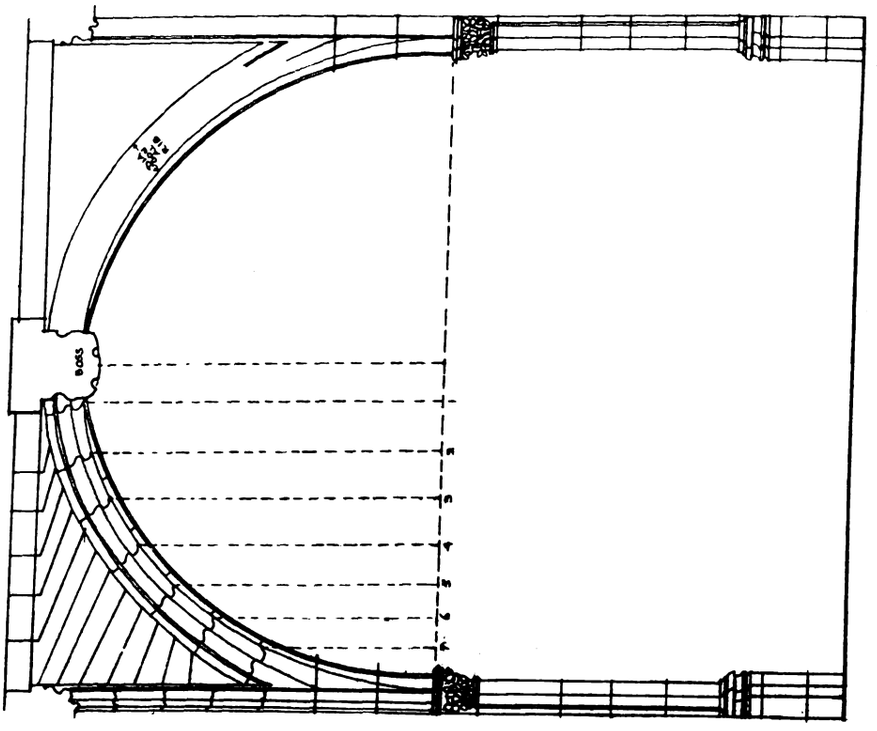
"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.

A STUDY OF A GROINED VAULT from the S. PORCH HOWDEN CHURCH





LONGITUDINAL SECTION.



CROSS SECTION.

MEASURED AND DRAWN BY "LOIDIS."

courses resting on a rebate on the ribs at each side and abutting upon ridge stones at the apex. The carved caps to the vaulting shafts are exquisite examples of the stone-cutter's craft, and represent the vine, ivy, oats, &c. The stone came from Huddlestone, and is a coarse-grained lime-stone; joints are from $\frac{1}{4}$ to $\frac{3}{8}$ inch in thickness.

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THE L.G.B. AND TOWN PLANNING PROCEDURE.

AT an interview between representative members of the National Advisory Town Planning Committee of the National Housing and Town Planning Council and Mr. J. A. E. Dickinson, the Comptroller of the Housing and Town Planning Department of the Local Government Board, held at the offices of the Board on Monday, November 28, the various points raised by the Conference on Town Planning Regulations held on July 26 were carefully considered.

The members of the Committee submitted the following points of difficulty:—

1. That the regulations governing the preliminary procedure relating to application for permission to prepare a scheme seemed to require such particulars as could only be given when a scheme had actually been prepared in some detail.

2. That especially many of the particulars required by the Regulations in Articles vi., viii. and x. were of a character which it would be premature to determine at the early stage of application for permission to prepare a scheme, and that any attempt at this stage to give an estimate of the cost of carrying a scheme into effect would necessarily be inaccurate and might endanger the success of the scheme.

3. That to comply with the requirements of Article vi., requiring at this preliminary stage a statement to be made in regard to the lines and widths of the principal roads proposed to be made under a scheme, would unduly hamper the proper consideration of the scheme at a later stage, and would render subsequent modification and negotiation with landowners more difficult.

4. That in reference to Article viii. (d) it did not seem necessary or practicable at the preliminary stage to determine how far sewerage and sewage disposal works would need modification or extension.

5. That in some cases the obligation to serve notices under Article i. upon all occupiers, of whatever tenure and interest, would be cumbersome and costly, and, to a large extent, unnecessary.

6. That it would be advisable to draw a distinction in procedure between schemes prepared by a Local Authority and schemes prepared by land-owners and adopted by a Local Authority. In view of the fact that in the latter case the schemes thus agreed to and adopted by the Local Authority would then in effect be fully prepared schemes, certain parts of the procedure would seem to be unnecessary and should if possible be greatly simplified.

(1) The Comptroller, in reply to (1), explained that the Local Government Board desired to assist Local Authorities in every possible way in the preparation of town planning schemes, but they considered that they were entitled to have from Local Authorities at the outset the whole of the facts and information which were in their possession relevant to the tentative proposals which the Local Authorities had under consideration, as well as a general indication of the outlines of the proposals. Amongst other things this would have the advantage of placing the Board in a better position to render assistance.

The Board in effect required Local Authorities, when applying for permission to prepare schemes, to send with their applications outlines of their tentative proposals in so far as these had been put into shape. Attention was drawn to the Board's Circular Letter of May 3, 1910, in regard to this matter.

(2) With regard to the question of estimates, the Comptroller stated that the Board fully recognised that it would not be practicable in all cases for a Local Authority at this preliminary stage of the proceedings to furnish accurate estimates of the cost of carrying a town planning scheme into effect, especially with regard to compensation.

The Board considered that the Act contemplated that some estimates of the cost of a scheme (and not merely the cost of preparing a scheme) should be prepared at this stage, and they were also of opinion that a Local Authority would desire to have for their own information, before embarking upon the preparation of a scheme, some general estimate of the cost likely to be incurred by the Authority and imposed upon the ratepayers, and it was this estimate—so far as the Local Authority could arrive at it—which the Local Government Board would require.

The Comptroller further pointed out that under the terms of Article x. (a) the estimated cost was to be stated "as nearly as may be practicable," and the Board recognised that nothing more than an approximate estimate would be practicable.

(3) With reference to the question of showing the lines and widths of the principal roads, the Comptroller pointed out that in a great many cases the necessity for or desirability of certain new links of communication would be an important, if not the chief, factor in the inception of a scheme, and would often have a material bearing on the precise area which should be included in the scheme; and in those cases, and also in some others, the desirability of linking up certain points would determine, within certain limits, the lines of the roads.

In such cases and in other cases where a Local Authority had, before making application for permission to prepare a scheme, given consideration to the desirability of constructing main thoroughfares, the Board would desire to have the tentative proposals of the Local Authority shown on Map No. 2.

The showing of these proposals on Map No. 2 was solely for the purpose of communicating to the Local Government Board the preliminary ideas of the Local Authority, and did not commit the Local Authority in any way to the scheme of roads thus outlined. Map No. 2 was not one of those required by the Regulations to be formally deposited for public inspection, though Article xxxii. (b) was applicable to it.

The Board would, moreover, not in any event insist on roads being shown as definitely fixed, and would accept dotted lines on Map No. 2, or even an indication that it was proposed to construct a road between two definite points without showing the actual line of the road. The Board simply wished to know what projects the Local Authority might already have in contemplation as probable or desirable. If it was contemplated that the scheme would not provide for the making of roads of the character referred to it would not be necessary to show any such roads on the Map No. 2.

(4) In reply to (4) the Comptroller stated that the only information the Board would require under the provisions of Article viii. (d) with respect to the effect of a proposed scheme on the existing system of sewerage and sewage disposal would be such facts as the Local Authority could readily give to enable the Board to appreciate the relation of the area comprised in the scheme to existing sewerage facilities. It is considered desirable that such information should be available at this stage of the procedure, especially perhaps in a case of an application relating to an area extending into two or more districts.

(5) In regard to (5) the Comptroller said that the Board could not entertain a proposal to omit entirely from Article i. the requirement as to notice to occupiers. Obviously in very many cases occupiers of land or premises included in a scheme would have substantial interests, and the Act clearly required that persons interested should have the opportunity of being heard at every stage. But when it is shown to the Board that the interests of occupiers are of a temporary character, *e.g.*, where the tenancies are terminable on very short notice, the Board are willing to consider an application under Article xxxiv. for dispensing with notices on that class of occupier.

(6) In reply to (6) the Comptroller explained that the Act did not recognise any distinction in procedure between a scheme prepared by a Local Authority and a scheme prepared by an owner and adopted by a Local Authority, but seemed to contemplate similar procedure.

If a scheme proposed by an owner related only to his own land, it would not follow that the interests of adjoining owners or other persons would not be affected. They might be affected materially. Moreover an owner might prepare a scheme dealing not only with his own land but also with lands of adjoining owners, and a variety of interests might be affected just as if the Local Authority were preparing the scheme. The provisions of the Act in regard to compensation and betterment would require the careful consideration of the Local Authority whether they prepared the scheme or adopted an owner's scheme, and in this connection the fifth paragraph of the Board's Circular Letter of May 3, 1910, should be noted.

It was not evident that it would be possible to modify the Regulations in regard to the adoption of owners' schemes generally, but in a case where a Local Authority applied for permission to adopt a well-considered and complete scheme it might be possible for the Board, on an application to them under Article xxxiv., to modify the procedure in the later stages. It would be a matter for consideration on the merits of the particular case how far this could be done consistently with the provisions of the Act and the proviso to Article xxxiv.

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The Comptroller finally emphasised the fact that the Regulations were drawn so as to be of general application, and stated that the Board would at all times have regard to the special circumstances of any particular case, and where good cause could be shown they would sympathetically consider applications made under Article xxxiv. for dispensing with or varying any requirement of the Regulations which could properly be dispensed with or varied having regard to the provisions of the Act and the proviso to the Article referred to.

LONDON ASSOCIATION OF MASTER STONEMASONS.

THE first annual dinner of the London Association of Master Stonemasons was held on Tuesday, the 13th inst., at the Inns of Court Hotel, the chair being occupied by Mr. Stephen Collins, M.P., J.P. Among those present were Mr. Arthur Keen, F.R.I.B.A., Mr. T. Stevens, Mr. Walter Lawrence, Mr. Alan Paull, F.S.I., Mr. Frank Mortimer, Mr. A. Roberts, Mr. John Pearson, Mr. Alexander Ritchie, J.P., Mr. Fred Corben, Mr. T. Sturge Cotterell, Mr. C. W. Courtenay, J.P., and Mr. Walpole Collins.

After the loyal toasts had been honoured, Mr. Stephen Collins, M.P., the chairman, proposed the toast of "The Association." Although, he said, they belonged to one of the oldest crafts, the London Association of Master Stonemasons was the youngest society in the building trade. After encountering very great difficulties they seemed to have made a good start, and it now appeared as if the fog that first surrounded them was being pierced by rays of sunlight. There had never been such a time for young men commencing business as the present; keen times were ahead, and it rested with the young men to make their prospects a great success by being abreast of difficulties. Business in the past had been carried on by rule-of-thumb, but those happy-go-lucky times were over. It was now necessary to acquire all the technical knowledge possible and get a scientific education if business was to be a success. He hoped that in their second year as a society they would all pull together.

Mr. C. W. COURTENAY, J.P., in reply, explained that the objects of the Association are to provide a convenient means for the discussion of matters connected with the trade and for the encouragement of good feeling and comradeship. There were no ulterior objects in view. In its short career the Society had fulfilled expectations. They were a democratic body and took in anybody connected with the trade in London who was qualified to join, no matter in how small a way of business he might be. One subscription, regardless of its size, only carried one vote. The Association had not been formed to work in antagonism to architects and builders, but solely to protect the interests of their own trade and of themselves; indeed, they tried to interpret as far as possible the wishes of those who employed them.

Mr. T. STURGE COTTERELL, J.P., of the Bath Stone Firms, Ltd., proposed the toast of "The Architects and Surveyors" by first congratulating Mr. Stephen Collins, the chairman, both on retaining his seat in Parliament and on representing the stone trade in the House of Commons. Architects and surveyors had often been spoken of at the meetings of the Association, but this was, he said, the first occasion on which they had had the pleasure of meeting them in that way. The Association's desire was to give satisfaction, and in giving architects satisfaction to give themselves satisfaction. In Great Britain there existed a greater variety of building stones than in any other country in Europe. Consequently they looked with a jealous eye on the unnecessary introduction of artificial building stones, and they hoped that architects would support them. If the young men of the architectural profession wished to be educated in stonework they could not do better than go to the quarries and stoneyards, where they would see things for themselves. Young architects would be welcome at any time, for they would thereby be taught some of the difficulties which had to be contended against.

Mr. ARTHUR KEEN, F.R.I.B.A., President of the Architectural Association, in replying to the toast, pointed out that whereas architects went as a profession no farther back than the early part of the seventeenth century, stonemasons go back to the dawn of history. He wished them all possible success, and hoped that the Association would meet with prosperity. They had a very grave responsibility in connection with the training of the young men of the trade. The old apprenticeship had decayed and left only a poor substitute in the technical schools. At one time the mason was an uneducated man, not having enjoyed the opportunities offered to him to-day. Now there was no reason why it should not be an artistic calling as well as a trade. The mason would derive great benefit from making a study of his calling.

Mr. ALAN PAULL, F.S.I., also responded to the toast.

Mr. FRED CORBEN proposed "The Builders and Contractors"; and Mr. Walter Lawrence and Mr. T. Stevens replied. Mr. LAWRENCE said that builders had passed through a bad time, and no doubt stonemasons had had the same. He was, however, quite confident that we are on the eve of a building revival. This was indicated by the way in which prices for materials were going up. Possibly the time was not far distant when builders would be in a tight corner from the difficulty of finding sufficient masons to carry out their work. Mr. T. STEVENS also corroborated the belief that we have reached a distinct revival in trade. He himself was getting far more inquiries and orders at better prices than three years ago. As a consequence he was able to treat sub-contractors better.

The toast of "The Visitors" was proposed by Mr. F. J. BARNES and responded to by Mr. ALEXANDER RITCHIE, J.P. The final toast was "The President," which was given by Mr. H. T. LUCAS and musically honoured; and Mr. S. COLLINS, M.P., J.P., replied.

A musical programme was given during the evening which concluded with "Auld Lang Syne."

THE METROPOLITAN CATTLE MARKET, ISLINGTON.

ON Friday last, the 9th inst., the Lord Mayor of London opened some new chill rooms and the foundation-stone was laid of an extension of the public slaughter-houses at the Metropolitan Cattle Market at Islington, which were provided by the Corporation in 1907. They are intended not only to replace the private slaughter-houses which formerly existed on the site, but to provide, in anticipation for increasing demands for facilities in the north of London, owing to the constantly decreasing number of private slaughter-houses and their probable final extinction at no distant date. The chill rooms are provided as an accessory to the slaughter-houses and to meet present-day requirements.

In the planning of the slaughter-houses the views of the trade have been met as far as is consistent with the main object in view, namely, slaughtering under proper supervision and expert examination immediately after slaughter, as the only method of safeguarding the detection of disease. The group of public slaughter-houses when completed, together with the chill rooms, will have entailed an expenditure of upwards of 60,000*l*.

The public slaughter-houses are the first to be provided in London, and as regards construction and fittings are believed to embrace the best features of any similar buildings in this country or on the Continent, and no expense has been spared to this end. To ensure cleanliness the walls are lined with glazed bricks, which will be constantly scoured with hot and cold water, and the buildings are paved with blue Pennant stone, which permits of frequent and effective flushing.

In the case of beasts the animals are lifted after slaughter by electric hoists, the first of their kind in England, though in use in many abattoirs in America and on the Continent. Every provision has been made for the humane and expert slaughtering of animals and to avoid unnecessary suffering.

A unique feature in connection with the slaughter-houses is the destructor house, in which is installed a Podewil apparatus or destructor. This is a German invention and, while in extensive use on the Continent, has been for the first time introduced into England. All condemned meat, as well as the offal from the slaughter-houses, is placed in a large cylinder, and is subjected for some hours to steam at a pressure of about 65 lb. The cylinder is then made to rotate, and the bones, &c., are crushed by heavy rollers, the product, in the shape of dry soft, brown powder, finding a ready market as a fertiliser.

The buildings are lighted by gas and electricity, the current being obtained from the Islington Borough Council.

The buildings have been erected from the designs of Mr. Sydney Perks, F.R.I.B.A., F.S.A., the City Surveyor, and are so planned that they can be extended without serious alterations.

The contractors for the erection of the new slaughter-houses are Messrs. W. Johnson & Co., Ltd., and for the refrigerating plant the Haslam Foundry and Engineering Company, Ltd.

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LICENTIATES AND THE R.I.B.A.

A SPECIAL meeting of the Leicester and Leicestershire Society of Architects was held at the Society's Room, 5 St. Martin's East, Leicester, on Thursday evening, December 8, when all architects in practice in the Society's province and their senior assistants were invited to attend.

Mr. W. M. Cowdell, President of the Society, was in the chair, and about forty gentlemen from all parts of the province attended.

Mr. A. W. S. Cross, Vice-President of the R.I.B.A., and Mr. G. Hubbard, F.S.A., member of the Council of the R.I.B.A., gave a full explanation and details of the scheme for the admission of Licentiates to the Royal Institute of British Architects.

Mr. Hubbard started by tracing the history of the R.I.B.A. from its earliest days, and its development from the Architectural Society instituted in 1831.

Both speakers very clearly and concisely pointed out the great advantage not only to architects, but to architecture, likely to result from an efficient Registration Bill, and if the application for such a Bill is to be successful the necessity for the Institute to have the great majority of the profession behind it before approaching Parliament.

The advantage to individual members of the profession who by reason of their age or the arduous duties of their calling cannot now hope to pass the very severe examination enabling them to obtain the diploma of Associate of the R.I.B.A., of being permitted until March 23, 1911, to join the temporary class of Licentiates was clearly shown to those present.

The possibility of the older Licentiates passing some form of examination enabling them to become Fellows of the R.I.B.A. was welcomed by a number of the practising architects present.

The addresses were followed by a discussion, in which many of those present took part, and about twenty-five applications for Licentiateship were received during the evening.

A very successful meeting was terminated by a hearty vote of thanks to the Council of the R.I.B.A., proposed by the President, and seconded by Mr. C. Kempson, for the work they have undertaken for the good of the profession. Messrs. Cross and Hubbard were also accorded a hearty vote of thanks, proposed by Mr. W. T. Topott, seconded by the ex-President, Mr. W. E. Keites, and supported by Mr. S. Perkins Pick, for the trouble they had taken in coming to Leicester.

AT a meeting held on Wednesday evening, the 7th inst., under the auspices of the Birmingham Architectural Association, the President, Mr. A. S. Dixon, M.A., in the chair, Mr. George Hubbard and Mr. A. W. S. Cross delivered addresses on the policy of the Council of the R.I.B.A. in regard to the formation of the new class of Licentiates of that body. Many architects from the surrounding districts attended the meeting, and many applicants filled in the nomination forms for the Licentiateship of the Institute. The proceedings terminated with the passing of a cordial vote of thanks to the Council of the R.I.B.A. for sending delegates to explain its proposals with regard to the statutory qualification of architects.

CHRISTMAS HOLIDAY ARRANGEMENTS.

THE South-Eastern and Chatham Railway issue week-end tickets, available by any train (mail and boat expresses excepted) from London on December 23, 24, and 25, available for return on 25th, 26th, 27th, or 28th, to Tunbridge Wells, Bexhill, St. Leonards, Hastings, Canterbury, Whitstable, Herne Bay, Birchington, Westgate, Margate, Broadstairs, Ramsgate, Sandwich, Deal, Walmer, Dover, Folkestone, Shorncliffe, Hythe, Sandgate, and New Romney (Littlestone-on-Sea). On Saturday, December 24, a fast late train will be run to Chatham, Sittingbourne, Sheerness, Faversham, Whitstable, Herne Bay, Birchington, Westgate, Margate, Broadstairs, Ramsgate, Canterbury, Walmer, Deal, and Dover, leaving Victoria at 12.30 midnight and Holborn 12.25 midnight, calling at St. Paul's 12.27 A.M., Elephant and Castle 12.31 A.M., Brixton 12.39 A.M., Loughboro' Junction 12.38 A.M., and Herne Hill 12.45 A.M. A similar train will also be run on Saturday, December 24, to Sevenoaks, Tunbridge Wells, St. Leonards, Hastings, Ashford, Canterbury, Ramsgate, Margate, Folkestone, and Dover, leaving Charing Cross at 12.15 midnight, Waterloo 12.17 A.M., Cannon Street 12.22, London Bridge 12.28, and New Cross at 12.37 A.M. Cheap tickets at the week-end fares will be issued by these trains for stations to which week-end bookings are in force. On Christmas Day several extra trains will run, but the ordinary Sunday services will be as usual. On Monday, December 26, cheap pantomime excursions will be run from the principal stations to London, returning about midnight. Frequent trains will be run from Victoria, Holborn, and Ludgate Hill to the Crystal Palace (High Level Station) and *vice-versa*. During the holidays several trains will be withdrawn or altered. Full particulars as to times of trains, alterations in train services, &c., will be found in the holiday programme and special train-service supplement.

Cheap return tickets will also be issued from London to Marseilles, Hyères, Cannes, Grasse, Nice, Monte Carlo, Mentone, and other stations on the French Riviera, *via* Folkestone and Calais, leaving Charing Cross station at 1 P.M. on December 23. Cheap excursions will be run from London to Paris, *via* Dover-Calais and Folkestone-Boulogne, on December 21, 22, 23, and 24; also from London to Brussels, *via* Dover-Calais, Folkestone-Boulogne, and Dover-Ostend, on December 21, 22, 23, 24, 25, and 26 inclusive. Cheap tickets will be issued to Boulogne on December 21, 22, 23, 24, 25, and 26. Cheap tickets will also be issued to Calais, Ostend, and Flushing. For golfing at Le Touquet (in the North of France) special arrangements have been made.

Christmas, with its holly, mistletoe, and yule log, is essentially the "home holiday" of the year, and in these days of expeditious and comfortable travel the unfavourable weather conditions need not exclude any who may wish to join the family circle at this festive season. We have just received a copy of a most attractive programme issued by the Great Central Railway Company. It is intended for those who are spending their Christmas in the Midlands, Yorkshire, Lancashire, Lincolnshire, or North of England. On Saturday, December 24, special expresses will leave Marylebone at suitable times for over 500 different stations. The tickets, issued at extremely low fares, will be available for return on the following Monday, Tuesday, Wednesday, or Saturday, enabling those who may so desire to spend the special Bank Holiday period with their friends. Breakfast, luncheon, or restaurant cars will be attached to the trains, and the compartments represent the acme of comfort, being well lighted and maintained at a genial temperature. Shopkeepers and others whose business will keep them in town until late on Christmas Eve will have the advantage of suitable night trains. Copies of this special A B C programme can be obtained free at Marylebone Station, Great Central Railway town offices and agencies, or post-free from Publicity Department, 216 Marylebone Road, London, N.W.

In anticipation of an early exodus from town to the West Country for the holidays, the London and South-Western Railway Company is running special dining-car expresses, at week-end and cheap third-class fares, on Friday evening, December 23, from Waterloo (North Station), at 7 P.M., to Exeter, Bude, Padstow, and other North Cornwall stations; at 7.25 P.M., to Exeter, Exmouth, Tavistock, Plymouth, &c.; at 7.35 P.M., to Ilfracombe, Bideford, and North Devon stations. Hot dinners (3*s*.) and suppers (2*s*.) served *en route*.

On Christmas Eve, December 24, special fast excursions will leave Waterloo about midnight for most places in Devon and Cornwall, and earlier in the evening to principal stations in Hants, Wilts, Dorset, Somerset, &c.

These excursion bookings allow of return on December 27, 28, 31, January 6 or 7.

The principal expresses from Waterloo to the West of England, Bournemouth, Swanage, Weymouth, Southampton, and Portsmouth (for the Isle of Wight) will be duplicated on the few days preceding Christmas Day.

The usual fourteen-day excursion tickets to Paris (first-class 39*s*. 3*d*., second 30*s*. 3*d*., and third 26*s*.) and to Havre for Normandy (24*s*. 6*d*.) will be issued—via Southampton—on December, 21, 22, 23, and 24, and on Friday, December 23, to St. Malo for Brittany (24*s*. 6*d*.), and Guernsey and Jersey (22*s*.).

For full particulars of cheap tickets, week-end facilities, special trains, &c., see programmes, obtainable from Mr. Henry Holmes, Superintendent of the Line, Waterloo Station, S.E.

MR. A. H. RICHARDSON, architect, Worksop, has prepared plans for a new children's ward to be erected at Worksop Victoria Hospital at a cost of 1,000*l*.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

Special Position Spaces.—Unless ordered for weekly insertions the Proprietors cannot guarantee particular dates.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

ARGENTINE.—April 20.—A competition of plans for a hospital and school of medicine, to be erected at Rosario in celebration of the Argentine Centenary at a cost of about 149,000*l.* Prizes of 1,050*l.*, 700*l.* and 440*l.* will be awarded. A copy of the conditions, &c., may be seen by British architects at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C., where also a limited number of copies are available for distribution. Plans must be sent to the "Secretaria de la Comisión Pro-Hospital é Instituto de Enseñanza Médica del Centenario, Calle Córdoba 1230," Rosario.

BRADFORD.—The Board of Management of the Bradford Infirmary invite plans with estimates for a new infirmary in Duckworth Lane. Mr. Keith Young, F.R.I.B.A., will act as assessor. Deposit 3*l.* 3*s.*, which will be refunded on receipt of a *bona-fide* design or if block plan, instructions, &c., are returned within a month after receipt of replies to competitors' questions. The Secretary Superintendent of the Royal Infirmary, Bradford. (For further particulars see advertisement.)

COVENTRY.—March 1.—The Corporation contemplate the erection of municipal offices in the centre of the city, and also possibly a town hall, and accordingly invite competitive designs. Mr. E. Guy Dawber, F.R.I.B.A., will act as assessor. Deposit 2*l.* 2*s.*, which will be refunded on receipt of a bona-fide design or if the particulars are returned within fourteen days of receipt. Mr. Geo. Sutton, town clerk, 10 Hay Lane, Coventry. (For further particulars see advertisement, November 18.)

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CUBA.—April 15.—An international competition has been arranged for a Presidential Palace to be erected at Havana at a cost of about 205,000*l.* Premiums of 10,000 pesos and 5,000 pesos will be awarded. Conditions may be seen at the Cuban Legation, 3 Grosvenor Mansions, Victoria Street, S.W., or the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C.

GLASGOW.—Jan. 31.—The Corporation invite plans of a proposed branch library at the corner of Saracen Street and Allander Street, Possilpark. Premiums of 50*l.*, 30*l.* and 25*l.*, will be awarded. A plan of the site and conditions may be obtained free from Mr. A. W. Myles, town clerk, City Chambers, Glasgow.

LLANDRINDOD WELLS.—The Urban District Council invite competitive plans for a pavilion in the recreation ground. First and second premiums will be awarded by an assessor. Mr. D. C. Davies, clerk, Llandrindod Wells.

PENRITH.—Feb. 8.—The Governors of Queen Elizabeth's Grammar School, Penrith, are prepared to receive competitive designs for the erection of a secondary school, accommodating 200 students, with provision for the conduct of technical and evening classes. Premiums are offered to competing architects—viz., first, 50*l.*; second, 25*l.*; third, 10*l.* Printed instructions will be forwarded upon receipt of stamped addressed large-post official envelope. Mr. James Cropper, The Vicarage, Penrith, clerk to the Governors.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Class IV.—Town plan of Gidea Park—prizes of 100*l.* and 50*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs; Class IV., March 31, 1911. Mr. Michael Bunney, A.R.I.B.A., hon secretary, 33 Henrietta Street, Strand, W.C.

TAUNTON.—Jan. 21.—The education committee invite architects, practising in the Borough of Taunton, to submit competitive designs for a provided school for 440 children. A block plan of site, together with conditions and instructions, may be obtained on application. No premium is offered, but the author of the selected design will have the carrying out of the work at 5*l.* per cent. Mr. George H. Kite, town clerk and clerk to the borough education committee, Municipal Buildings, Taunton.

CONTRACTS OPEN.

BEDLINGTON.—Jan. 10.—For erecting a Council school, to accommodate 568 scholars, at Bedlington Station, Northumberland. Send names and 2*l.* 2*s.* deposit by December 31 to Mr. C. Williams, secretary, Moothall, Newcastle-on-Tyne.

BELFAST.—Jan. 2.—For the construction of a coaling stage at their locomotive depot, Adelaide and Windsor Station, near Belfast, for the Great Northern Railway Co. (Ireland). The Chief Engineer's Office, Amiens Street Terminus, Dublin, and the District Engineer's Office, Belfast. Send 2*l.* to Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

BOLTON-UPON-DEARNE.—Dec. 29.—The West Riding Small Holdings and Allotments Committee invite whole tenders for the following works:—New farmstead at Bolton-upon-Dearne (builder, carpenter and joiner, slater, plumber and glazier, plasterer and painter). The West Riding Architect, County Hall, Wakefield. Send 1*l.* deposit to the West Riding Treasurer, County Hall, Wakefield.

BOURNEMOUTH.—Jan. 2.—For alterations to "Brading," Stafford Road, and other works in connection therewith, for the Town Council. Deposit 1*l.* 1*s.* Mr. F. W. Lacey, borough engineer.

BRADFORD.—Dec. 24.—For the various works required in erection of new Wesleyan Methodist mission hall, situate corner of Cliffe Road and Bolton Road. Send names and 1*l.* 1*s.* deposit to Mr. H. W. Long, architect, Fairmeade, Calverley, near Leeds.

BURNOPFIELD.—For erection of a small villa at Burnopfield, Durham. Send names to Mr. A. W. Wilson, architect and surveyor, Pilgrim Street, Newcastle-on-Tyne.

BURNOPFIELD.—Dec. 29.—For the works required in alterations and additions to the Black Horse Inn. Mr. T. H. Murray, architect and surveyor, Consett.

CANTLOP.—Jan. 6.—For the following works at Cantlop, five and a half miles from Shrewsbury, about two miles from Berrington Station, G.W.R., and about two miles from Condover Station, G.W. and L. & N.W. Railway, viz.:—(1) One new cottage; (2) five sets of new farm buildings; (3) alterations, additions and repairs to two existing homesteads; (4) alterations, additions and repairs to three existing cottages, for the Salop County Council. Mr. Wm. T. Hall, agent, College Hill, Shrewsbury.

CHESTER.—Jan. 11.—For the erection of Chester new station sorting office. The Postmaster, Head Post Office, Chester. Send 1*l.* 1s. to H.M. Office of Works, Storey's-gate, S.W.

DARLINGTON.—Jan. 4.—For the reconstruction of premises in Printing House Square, occupied by Messrs. W. E. Dove & Co., Ltd., and others. Send names by Dec. 31 to Messrs. Hoskins & Brown, architects, Court Chambers, Darlington.

DONCASTER.—Feb. 1.—For the whole of the work in connection with the new institute, for the Trades and Friendly Societies' Institute, Ltd. Send names and 1*l.* 1*s.* deposit to Mr. F. Norman D. Masters, M.A., architect, Bank Chambers, Scot Lane, Doncaster.

FAREHAM (HANTS.).—Dec. 28.—For erection of a drill hall, offices, drainage, fencing, &c., at Fareham, Hants, for the occupation of the Wessex (Hampshire) Royal Garrison Artillery. Deposit 3*l.* Mr. Wilberforce Cobbett, C.E., Fareham, Hants.

FOURLANESEND.—Jan. 7.—For erection of a Council school at Fourlanesend, near Millbrook, Cornwall. The District Education Office, Saltash, or Mr. B. C. Andrew, architect to the committee, Biddick's Court, St. Austell.

HANDSWORTH.—Jan. 5.—The West Riding Education Committee invite whole or separate tenders for the erection of boundary wall (builder) at Handsworth Council School. The Education Architect, County Hall, Wakefield.

HAVERTHWAITE.—Dec. 31.—For alterations to the Old School House at Brow Edge. The Backbarrow Co-operative Stores, Lancs.

HEREFORD.—Dec. 31.—For extension of the Hereford Free Public Library. Deposit 3*l.* Messrs. Groome & Bettington, architects, Hereford.

HOVE (SUSSEX).—Jan. 4.—For constructing an underground lavatory, south side of Livingstone Road, corner of Goldstone Street. The Borough Surveyor.

HULL.—Dec. 30.—For erection of new training college, Cottingham Road, including the college block, hostels for men and women students, principal's residence, gate lodge and entrance gates, fencing, drainage, roads, earthwork, &c., for the Education Committee. (Messrs. Crouch, Butler & Savage, architects, Birmingham.) Send names, together with a deposit of 5*l.* 5*s.* to the City Treasurer, Town Hall, Hull.

HUNSLET.—Jan. 7.—For the erection of moulding shop and reconstruction of roof. Deposit of 10*s.* for each contract, viz. bricklayer, &c., carpenter, slater, plumber, painter and steelwork. Messrs. Myers-Beswick & Partners, engineers, 8 Park Square, Leeds.

IRELAND.—Dec. 31.—For erection and completion of a manse adjoining Ballee Unitarian Church, near Downpatrick. Messrs. Hobart & Heron, architects, Scottish Provident Buildings, Belfast.

ISLE OF WIGHT.—Dec. 24.—For erection of a class-room and alterations to the Freshwater Council school. The County Education Offices, Newport, I.W., or the Architect's Office, St. Thomas's Street, Ryde, I.W.

ISLE OF WIGHT.—Dec. 31.—The Board of Trade invite tenders for erection of a rocket life-saving apparatus house at Blackgang. The Coastguard Station, Blackgang.

KEIGHLEY.—For erection of a detached residence at Brown Lane, Black Hill. Messrs. R. B. Broster & Sons, architects and surveyors, Craven Bank Chambers, Keighley.

LONDON.—Jan. 9.—For structural repairs at Nos. 403-9 Mile End Road, E., for the Whitechapel Guardians. The Clerk, 74 Vallance Road, Whitechapel, E.

LONDON.—Jan. 9.—For the renewal of the zinc roof on a portion of the Vallance Road Infirmary, for the Guardians of Whitechapel Union. The Steward of the Infirmary, 74 Vallance Road, N.E.

MANCHESTER.—Dec. 31.—For alterations and additions to the municipal school in Cavendish Road, Withington. Deposit 1*l.* 1*s.* The Education Offices, Deansgate, Manchester.

MEXBORO'.—Dec. 31.—For erection of a Wesleyan Methodist chapel adjoining the present school chapel. Mr. A.

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Brocklehurst, Palatine Bank Buildings, Norfolk Street, Manchester.

NEWTON ABBOT.—Jan. 3.—For erection of additional wards at the infirmary. Deposit 2*l.* 2*s.* Mr. Samuel Segar, 24 and 26 Union Street, Newton Abbot, Devon.

OLDHAM.—Jan. 10.—For the various works required in the construction of a pumping station, comprising engine-house, workshop, store-room, &c., together with boundary wall and other works in connection therewith, to be erected at Butterworth Hall, Milnrow, for the Oldham Waterworks Committee. Deposit 2*l.* Mr. Charles J. Batley, M.I.C.E., Piethorn, Newhey.

PUDSEY.—Jan. 7.—For erection of United Methodist Sunday school and institute. Deposit 10*s.* Mr. W. Hugill Dinsley, architect, Chorley, Lancs.

SCARBOROUGH.—Jan. 5.—For the construction of an engine house, &c., at the Cayton Bay Pumping Station. The Water Engineer's Office, Town Hall, Scarborough.

SHEFFIELD.—Dec. 30.—For the supply, delivery and erection of materials for extensions to the Neepsend Power House, comprising extension of the engine room, boiler house and coal store, new pump room, turbine and boiler foundations, &c. Deposit 2*l.* 2*s.* Mr. S. E. Fedden, general manager and engineer, the Corporation Electric Supply Department, Commercial Street, Sheffield.

TRURO.—Dec. 28.—For erection of a proposed new river wall at Dixon's, Ltd., Malpas Road. Mr. Alfred J. Cornelius, M.S.A., architect, Truro.

WALES.—Dec. 29.—For carrying out alterations, repairs, painting, &c., to Tabernacle Congregational church and school, Duke Street, Aberdare. Mr. J. Llewellin Smith, M.S.A., Aberdare.

WALES.—Dec. 31.—For building two semi-detached villas on the Gwbert Road, Cardigan. Mr. L. Lewis, architect and surveyor, Market Square, Cardigan.

WALES.—Dec. 31.—For erection of a residence on Hillside Park, Gilfach, Bargoed. Mr. Idris Leyshon, architect and surveyor, 7 Hanbury Road, Bargoed.

WALES.—Jan. 5.—For erection of two pairs of cottage homes for children at Llwydcoed, Aberdare, for the Guardians of Merthyr Tydfil Union. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

WALES.—Jan. 9.—For erection of twenty or more dwelling-houses at Carnetown, Abercynon, for the Salisbury Building Club. Mr. Treharne Jones, architect and surveyor, Nelson, via Cardiff.

WIMBORNE.—Jan. 1.—For erection of an elementary school at Redcotes, Wimborne, Dorset. The County Surveyor's Department, County Offices, Dorchester, and Messrs. Fletcher, Son & Brett, Wimborne.

WINCHESTER.—Jan. 16.—For the supply and fixing of deal and other office fittings at the new County Council offices, Castle Avenue. Deposit 5*l.* 5*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

YORKS.—Jan. 5.—For the following works, for the Education Committee of the East Riding County Council, viz.:—(*a*) Erection of a Council school for girls and infants, with accommodation for 520 children at Norton (Malton); (*b*) erection of a Council school for 202 children and teacher's house at Welton. The Building Surveyor, County Hall, Beverley.

YORK.—Jan. 9.—For the erection of new stores in Railway Street, for the York Equitable Industrial Society, Ltd. Deposit 2*l.* 2*s.* Mr. H. B. Beck, 28 High Street, Doncaster.

TENDERS.

BOURNEMOUTH.

For rebuilding the Victoria Hotel. Mr. H. E. HAWKER, architect, Bournemouth.

Goodchild & Jeffery	£6,270
Fryer & Co.	5,997
Stephens, Bastow & Co.	5,989
Perry & Co.	5,930
Bowman & Sons	5,900
Grigg	5,690
Miller & Sons	5,680
Pittard & Sons	5,628
A. & F. Wilson	5,600
Wilkins & Son	5,549
Jones & Seward	5,427
Jones & Son	5,374
J. & M. Patrick	5,278
Rouse	5,181
JENKINS & SONS, Bournemouth (*accepted*)	5,180

BARNET.

For the erection of twenty-nine cottages in Mays Lane, for the Urban District Council. Mr. W. F. WILKINS, surveyor.

	Stock Bricks.	"Sandy" Stocks.
Pasterfield & English	£8,700 0 0	£8,820 0 0
Holmes	7,921 0 0	7,951 0 0
Mattock & Parsons	7,659 0 0	7,759 0 0
Lowe	7,515 0 0	7,505 0 0
Parker & Co.	7,500 0 0	7,500 0 0
Gibson & Co.	7,450 0 0	7,566 0 0
Woolaston & Co.	7,400 0 0	7,960 0 0
Kidman Bros.	7,350 0 0	7,350 0 0
Thomas & Edge	7,346 0 0	7,346 0 0
F. Cottrell, Ltd.	7,230 0 0	7,210 0 0
Bushell	7,225 0 0	7,225 0 0
H. Freeman, Ltd.	7,105 0 0	7,221 0 0
Dainton	6,995 0 0	7,055 0 0
Fox	6,900 0 0	7,050 0 0
Strong & Co.	6,849 0 0	6,849 0 0
Myles & Warner	6,791 0 0	6,880 0 0
Halls & Son	6,785 0 0	6,785 0 0
Groom	6,729 0 0	6,682 0 0
Percy	6,725 0 0	6,772 0 0
Willmott & Sons	6,700 0 0	6,750 0 0
Roberts & Co.	6,660 0 0	6,725 0 0
Gathercole Bros.	6,560 0 0	6,610 0 0
Slough	6,550 0 0	6,507 0 0
Linzell	6,464 0 0	6,484 0 0
Rowley Bros.	6,409 0 0	6,387 0 0
Bailey & Sons	6,265 0 0	6,390 0 0
Vail & Shore	6,210 0 0	6,309 0 0
Pearson & Son	6,189 0 0	6,189 0 0
Monk	6,100 0 0	6,200 0 0
Lewin & Sons	5,949 0 0	5,997 0 0
Clarke	5,910 0 0	5,920 0 0
Wright & Co.	5,875 0 0	5,900 0 0
Eyles	5,859 0 0	5,859 0 0
Brown	5,768 0 0	6,203 0 0
Galliford	5,760 0 0	5,750 0 0
Jaggard	5,539 0 0	5,583 0 0
Spalding & Sons	5,500 0 0	5,500 0 0
Batchelor & Son	5,500 0 0	5,560 0 0
W. & D. Wilkins	5,494 0 0	5,594 0 0
Nicholls & Son	5,253 0 0	5,345 0 0
Sykes & Son	5,215 0 0	5,365 0 0
JACOBS, Anerley, S.E. (*accepted*)	5,169 0 0	5,194 0 0
Surveyor's estimate	5,510 0 0	—

BIGGLESWADE.

For the erection of three pairs of cottages, Saffron Road, for Mrs. C. Fergusson. Mr. THOMAS COCKRELL, A.M.I.C.E., Architect, 8 Bank Buildings, Bedford, and Biggleswade.

Wrycroft & Sons	£1,175 0 0
Bartle & Son	1,120 0 0
Woodward	1,020 0 0
WRIGHT, Langford (*accepted*)	1,015 0 0

CHISLEHURST.

For private street improvement works in Knoll Road.

Knight	£2,112 0 0
Woodham & Sons	1,707 0 0
Free & Sons	1,676 18 4
Peill & Sons	1,669 0 0
Wood & Sons	1,644 10 0
Trueman	1,580 0 0
Mowlem & Co., Westminster (*recommended*)	1,522 0 0
Porter	1,305 7 8

DARREN-VIEW.

For erection of an infants' school at Darren-View to accommodate 260 children, for the Merthyr Education Committee.

W. & J. Jenkins	£4,784 0 0
Jones	4,549 0 0
Fleetwood	4,530 0 0
Davis	4,460 1 7
Davies & Son	4,360 0 0
Jones Bros.	4,060 0 0
WILLIAMS & SON, Dowlais (*accepted*)	3,946 1 2
Colborne	3,769 10 0

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GRIMSBY.

For extension of the Free Library. Mr. H. GILBERT WHYATT, A.M.I.C.E., borough engineer and surveyor.

Waterman	£1,237 10 0
Marshall	1,210 0 0
Smith	1,106 0 0
Hewins & Goodhand	1,100 0 0
Swaby & Walsham	1,095 0 0
GILBERT, Grimsby (*accepted*)	1.092 17 6

KENDAL.

For the erection of two semi-detached houses in Natland Road. Mr. JOHN STALKER, architect, Kendal.

Accepted tenders.

Dixon & Son, excavating, walling, mason, and slating work	£372 0 0
Park & Bro., joiner	254 10 0
Jackson & Co., plumbing, glazing, gas and water fitting	128 10 6
Steele & Co., plastering	38 5 0

All of Kendal.

LONDON.

For removing three iron buildings, offices, coal store, &c., from the Hitherfield Road site, Wandsworth, and re-erecting them on the Venetian Road site, Norwood, including new foundations, drainage, &c.

Croggon & Co.	£1,715
Humphreys	1,450
McManus	1,425
Harbrow, South Bermondsey (*recommended*)	1,381

For the enlargement by 80 places of the L.C.C. junior mixed school on the Thomas Street site, Limehouse.

Groves	£1.510 0 0
Newell & Lusty	1,466 5 7
Akers & Co.	1,423 0 0
E. A. Roome & Co.	1,381 0 0
Symes	1,370 0 0
E. Lawrance & Sons	1,325 0 0
Holloway	1,313 0 0
Long	1,310 0 0
Horswill	1.283 0 0
J. & C. Bowyer	1,264 0 0
Thomas & Edge, Woolwich (*recommended*)	1.254 0 0
Architect's estimate	1.295 0 0

For the electrically driven motor (escape) vans which it is proposed to place at the new fire stations in Parnell Road, Bow, and Brunswick Road, Bromley-by-Bow.

Wright & Wood, Ltd.	£304 0 0
General Electric Co.	293 0 0
Lancashire Dynamo and Motor Co.	280 15 0
Electric Construction Co., Wolverhampton (*recommended*)	260 0 0
Chief Engineer's estimate	260 0 0

For the construction of the second portion of the embankment wall between Lambeth Bridge and Victoria Tower Gardens, for the L.C.C.

Fasey & Son	£38,694 11 10
Rowlingsons & Co.	38,078 5 0
Perry & Co. (Bow)	35,771 0 0
Coles	35,674 14 8
Pethick Bros.	35,640 0 0
D. R. Paterson, Ltd.	33,721 10 8
Henry Lovatt, Ltd.	33,197 8 5
Muirhead & Co.	32,173 0 6
Pearson & Son	32,121 13 2
Mitchell Bros.	31,091 12 3
Dick, Kerr & Co.	29.459 7 7
Scott & Middleton	28,082 4 8
Kirk & Randall	26,978 0 0
Monk & Newell	25.217 1 6
Leslie & Co.	24,831 0 0
Mowlem & Co., Ltd., Grosvenor Road, S.W. (*recommended*)	24,642 0 0
The British Construction Co.	23,927 0 0
Chief engineer's estimate	31,729 0 0

For the provision of a lift at No. 23 Belvedere Road, for the L.C.C.

Easton Lift Co.	£395 0 0
Smith, Major & Stevens	375 0 0
Waygood & Co.	344 10 0
Medway's Safety Lift Co., Deptford, S.E. (*recommended*)	295 0 0
Architect's estimate	350 0 0

OPENINGS FOR BRITISH TRADE.

THE *Board of Trade Journal* contains several references to building projects which should prove of value to firms in this country.

The *Gaceta de Madrid* of December 7 contains the text of a Bill drawn up by the "Ministerio de Hacienda," under the terms of which a sum of 450,000 pesetas (about 17,000*l.*) is earmarked for the purpose of building a Spanish hospital in Tangier.

The *Anzeiger* of December 8 announces that the municipal authorities of Szeged have earmarked the following items for disposal during 1911:—5,510,000 kronen (about 230.000*l.*) for building schools, a music-hall, and a hospital; 3,000.000 kronen (125,000*l.*) for city drainage works, and about 33.000*l.* for street asphalting works.

The *Gaceta de Madrid* of December 9 publishes a notice, issued by the "Ministerio de Instrucción Pública y Bellas Artes," Madrid, inviting tenders for the erection of a new building intended for the General and Technical Institute and School of Art in Santander, Spain. Tenders will be opened on January 14 at the above-mentioned "Ministerio." Although the above contract will in all probability be awarded to a Spanish firm, nevertheless the carrying out of the work may involve the purchase of some materials out of Spain.

The following item is extracted from the Swiss Federal Budget for 1911, published as a supplement to the *Feuille Fédérale Suisse* of November 30:—Department of the Interior.—Direction of Federal Constructions: Building construction, 1,260.140 fr., of which 381,040 fr. for the completion of the new post and telegraph office at Lugano.

H.M. Trade Commissioner reports that a new art gallery is to be erected at Montreal, Canada. Work is to be begun on the building early in the spring. The name and address of the architect may be obtained by British builders, furnishers, &c., on application to the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

GLASGOW INSTITUTE OF ARCHITECTS.

A QUARTERLY general meeting of the Glasgow Institute of Architects was held last week in the Secretary's chambers, 115 St. Vincent Street, Mr. John B. Wilson, F.R.I.B.A., president, in the chair. Reference was made to the death of Mr. David Thomson, who was one of the original members of the Institute, having joined in 1868. Mr. Arthur D. Hamilton, 212 St. Vincent Street, was unanimously elected a Fellow of the Institute. The Secretary submitted a report on the matters which had been dealt with by the Council since last general meeting. A proposed scheme of architectural education in the Glasgow School of Architecture was being considered by the Council. It had been found impracticable to arrange for the proposed exhibition in Glasgow of the drawings shown at the Town Planning Exhibition in London. The Council had called the attention of the Fine Art Committee of the Scottish National Exhibition to the omission of architecture from the proposed exhibits, and the committee had agreed to include architectural designs among the exhibits.

The Council, as trustees for the Alexander Thomson memorial, had arranged the programme for the next competition, the drawings for which are to be lodged with the Secretary on December 29, 1911.

The Alexander Thomson Travelling Studentship is to the value of 60*l.*, and is competed for every third year. It is open to architectural students between the ages of nineteen and twenty-eight years, residing in the United Kingdom, and qualified as described in the deed of trust.

The Trustees also offer a prize of 20*l.* for the second best set of drawings should the number of the competitors and the quality of the work submitted be such as to warrant, in the opinion of the adjudicators, an additional prize being given.

The subject for competition is:—

A bridge with approaches spanning a river 500 feet wide with terrace on either side 50 feet wide. The following details are given:—The terrace to be 15 feet below road level; range of tide, 10 feet; terrace to be 8 to 10 feet above high-water level; roadway of bridge, including footpaths, to be 100 feet wide; architectural features may be beyond this. Camber of bridge not more than 1 in 30. The approach to the bridge may be treated with triumphal arch or any other architectural feature. Access from road to terrace and from terrace to water should be arranged. The scheme generally to be treated as an architectural and not as an engineering

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problem. The drawings required, which are to be on sheets 40 inches by 27 inches, must be as follows:—Elevation of bridge with section of terrace and road, showing approach to one end of bridge; section of bridge showing elevation of terrace, &c.; and plan. These to be drawn to a scale of ½ inch equal 10 feet.

The Institute has made arrangements with the following gentlemen to give lectures before the Institute, viz.:—Mr. J. A. Gotch, of Kettering, on January 27; Mr. A. W. Cross, M.A., London, on February 23; and Mr. Oldrieve (on the subject of Glasgow Cathedral roof), on March 16. The matter of bringing the subject of Licentiateship of the R.I.B.A. before the members of the Institute and other architects in the Institute's province was fully discussed, and it was agreed that this could be best accomplished by issuing a circular calling attention to the desirability of all architects who are not already members of the R.I.B.A. and who are eligible for admission as Licentiates joining this class, and pointing out that the period during which applications can be received expires on March 1, 1911.

LICENTIATES AND THE R.I.B.A.

A SPECIAL meeting of the Nottingham Architectural Society was held at the Society's Rooms, 64 St. James Street, Nottingham, on Friday evening, December 16.

An invitation had been sent to all architects in Nottinghamshire and Lincolnshire, and there was a very good attendance, gentlemen having come from all parts of the province.

THE PRESIDENT (Mr. Robert Evans, Jun.) occupied the chair, and briefly introduced Messrs. Hubbard and Cross, members of the R.I.B.A., who had come down specially from the Royal Institute to explain the scheme.

MR. HUBBARD, a member of the Council of the R.I.B.A., pointed out that the advantages of registration would be that all architects would be united by an *esprit de corps* that would prevent the present under-cutting of each other's charges. By registration their scale of fees would be recognised in the courts of law, and the architectural work by builders and others would be done by trained architects. Mr. Hubbard explained that although difficult to examine in Art, the Royal Academy and similar institutions of this and other countries and the R.I.B.A. have held examinations in art for many years past, and no one has complained that the result was not satisfactory. The Royal Institute were anxious to enrol all qualified practising architects before March 1911 as Licentiates. A Bill would then be presented to Parliament, and, if obtained, any other person desiring to practise as an architect would then be required to pass an examination. Mr. Hubbard informed the meeting that the Society of Architects (whom he recognised as the pioneers of the movement) had been invited to send members to a joint conference at the Royal Institute to consider the framing of the proposed Bill.

MR. CROSS, a Vice-President of the Royal Institute, urged that upon a Registration Bill depends the well-being of the architectural profession and the well-being of the R.I.B.A. By joining the Royal Institute as Licentiates the profession would be welded together for mutual assistance, whereas at present it is somewhat disconnected. By a personal connection with the Royal Institute assistance would be obtained upon matters of professional practice, etiquette, and the payment of fees. The splendid architectural loan library would be accessible to every practising architect in the kingdom, and when in London every architect would have a home to go to where he could meet his professional brethren.

Several questions were asked by Messrs. Mettham and Bond (of Grantham), Mr. Moss (of Mansfield), Messrs. Bromley, Gleave, and Dale (of Nottingham), and others, and were carefully and fully answered by the delegates, who explained that their object in visiting the different societies was to obtain every information as to difficulties and differences in practice, so that they might be considered in framing the Bill.

At the close of the meeting the majority of those present showed their support by filling in application forms. The thanks of the meeting were accorded the Council of the R.I.B.A. for sending delegates, and Messrs. Hubbard and Cross were also heartily thanked for coming down and so fully explaining the scheme.

A largely attended meeting was held at the Liverpool Architectural Society's Rooms on Monday, the 12th inst., with Mr. Arnold Thornely, the President, in the chair.

Mr. A. W. S. Cross and Mr. Hubbard delivered their addresses in explanation of the R.I.B.A. Council's policy in creating the new class of Licentiate members.

The meeting cordially supported the Institute's proposals, and many architects applied for application forms. Thanks to the energy of the President of the Liverpool Society and its hon. secretary, Mr. Fraser, many architects came from a considerable distance from Liverpool and gave some interesting experiences, showing the necessity for carrying forward the Institute's policy of obtaining registration.

On the following evening Messrs. Cross and Hubbard addressed a meeting at Rhyl, at which Messrs. Thornely and Fraser again attended. This meeting was arranged at the suggestion of Mr. George Humphreys, of Llandudno, who made an excellent speech in support of the movement. All the architects present who were not attached to the Institute or any allied society signified their desire of joining the Institute as Licentiates.

VARIETIES.

THE Leeds City Council intend to enlarge their school in Town Street, Beeston, by providing additional accommodation for about 300 children.

THE Wakefield Education Committee on Tuesday passed plans for a new school in Lawefield Lane, and decided to apply to the Local Government Board for sanction to borrow 12,000*l.* for its erection.

AT Largs Dean of Guild Court plans submitted by Mr. Strachan for the erection of a public hall behind his tenement were passed. The hall is to accommodate 500 or 600 people.

THE Southend-on-Sea Corporation invite designs for the cover of the programme for the performances of the Army bands in the cliffs, pier and East Parade bandstands during the season 1911. A prize of 5*l.* 5*s.* is offered for the selected design. Competitors must send in designs to the Town Clerk by January 2.

A TECHNICAL institute is to be erected at Edmonton, two-thirds of the cost of which will be borne by the Middlesex County Council and the remaining third by the District Council.

AT a special vestry meeting held at Witley it was decided to pull down the existing vestry and erect a new vestry square with the walls of the church, at the same time enlarging the church itself by throwing in the space on which the vestry now encroaches. The total cost will be about 1,100*l.*

THE Southend-on-Sea Town Council have approved three new tramway routes. The extension of the Southchurch section with Thorpe Bay provides for a roadway 100 feet in width, on the French boulevard principle, the track being laid between lines of trees.

THE Middlesex County Council have resolved, in regard to the proposed new Guildhall, to clear the whole of the site and proceed with the building, which would be completed at a cost of 72,000*l.* in eighteen months. It had originally been proposed to leave a portion of the building standing.

THE Great Earl's Court Sunday Skating Club held their opening meeting on the 18th inst. Every member will be permitted to introduce (both afternoon and evening) either two ladies or one gentleman to the fine rink at Earl's Court, W.

MESSRS. PATMAN & FOTHERINGHAM, builders and contractors, Theobald's Road, W.C., have obtained the contract for rebuilding large premises in King Street and Duke Street, St. James's, W., for Messrs. Knight, Frank & Rutley, under Messrs. Harris & Moodie, architects.

THE Plymouth Borough Surveyor has prepared plans for the improvement of the bathing accommodation at Tinside at a cost of 2,000*l.* The plans provide for the construction of a new approach from the road above the cliff to the beach, and for the construction in recesses in the cliff of two blocks of bathing-houses, each two storeys high.

FINCHLEY District Council have made application to the Local Government Board for sanction to borrow sums amounting to 12,275*l.* for acquiring lands in Long Lane and Totteridge Lane for use as pleasure grounds. This course has been adopted on the recommendation of the recently appointed Town Planning Committee.

THE Controller and Auditor-General, Parliament Street, Cape Town, will receive tenders up to noon on March 1 for the installation of a system of ventilation, heating and cooling in the new Law Courts, Cape Town. Further information may be obtained from the High Commissioner for the Union of South Africa, 100 Victoria Street, London.

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THE REGISTRATION OF PLUMBERS.

A MEETING of General Council for the National Registration of Plumbers was held at the Guildhall on Monday afternoon last. A welcome was given by the Right Hon. Sir T. Vezey Strong. It was, he said, as Lord Mayor, as well as Master of the Plumbers' Company, his privilege and great pleasure to welcome to Guildhall so many representatives of the plumbers', the architects' and the public health and water authorities of the United Kingdom, joined together for the purpose of conference on a subject which affects the health and comfort of all classes of the population. To each and to all the efficiency and wholesomeness of the sanitary arrangements and the water services is a vital consideration. There has been a great and growing endeavour of the medical profession to advance the measures for the prevention of disease. A great movement has grown up during the past twenty-five years for placing the work of the plumber in its right relation to the public health service. The profession not only localised and explained the causes of certain classes of disease and ill-health, attributable to defective sanitary arrangements, but took counsel with plumbers as to practical means of remedying the defects. Architects, water engineers and others co-operated with the sanitary authorities in advancing these objects. When the Plumbers' Company was asked to take the headship of this great movement and to devote their funds to its advancement, the most sanguine person could hardly have conceived the possibility of reaching by this time the position which the movement has actually achieved. In every centre of the United Kingdom the plumbers, the architects and the public authorities are getting more and more closely into touch with one another and with the company. The Council of the Royal Institute of British Architects have recently informed the company of their approval of the system of marking the work of registered plumbers when it complies with certain standards and comes within the regulations which are exercisable by the Board of Trade for purposes of public advantage. It may be that these standards are higher than those deemed sufficient for some purposes, but however that may be, the effect of such higher standards being set up, and the Council of the Institute being in co-operation with the company, must tend to the general advancement of plumbers' practice and the further protection of the public health and welfare. The Council of the Institute has taken steps to commend the object to the notice of the allied societies. The object may be greatly promoted by the public co-operating with the authorities by employing registered plumbers. The reconstitution of the management of the registration movement, with a view to giving fuller representation to the plumbers, the architects and others officially and professionally concerned for the public in the specification and regulation of plumbers' work was no doubt desirable, and it must yield fuller advantages as time advances. Experience has shown certain changes of a consolidating nature are required in the management of the central arrangements.

A banquet of the Worshipful Company of Plumbers was given at the Mansion House on Monday evening, with the Lord Mayor, Sir T. Vezey Strong, as Master, occupying the chair. Among those present were Sir Thomas Barlow (President of the Royal College of Physicians), Sir Felix Schuster, Sir Samuel B. Provis, Sir Robert L. Morant, Sir James H. Harrison, Sir Swire Smith, Sir Henry Tanner, I.S.O., Sir Shirley F. Murphy, Mr. Leonard Stokes (President of the Royal Institute of British Architects), Sir Gerard Muntz, Bart., Dr. W. G. Willoughby (President of the Incorporated Society of Medical Officers of Health), Mr. W. A. Appleton (Secretary of the Federation of Trade Unions), Dr. G. C. Kingsbury, Dr. Louis Parkes, Mr. H. D. Searles-Wood, Mr. H. P. Boulnois, Mr. Frank Sumner, Mr. W. H. Humphreys, the Masters of a large number of City Companies, and Mr. Wm. R. E. Coles, the clerk. After the loyal toasts had been honoured, Sir Thomas Barlow, Bart., K.C.V.O., gave "The Lord Mayor, the Corporation and the Sheriffs of the City of London."

The LORD MAYOR proposed "Civic Institutions and their Relation to Industrial Training." He first emphasised the fact that the Plumbers' Company provided an important example of the practical adaptability of old institutions to modern needs. In 1365 it was decreed that no one of the trade of plumbers shall touch such work except by the assenting of the skilled men of that trade testifying that he knows how well to work, so that the trade be not scandalised or the commonality damaged and deceived. That afternoon he (the Lord Mayor) had welcomed at the Guildhall a gathering of representative plumbers and public authorities concerned in the work of plumbers in its public health aspects and their work in relation to the water service, which tended to grow more complex and more costly. They had no better policy to announce than that mentioned above, and which was uttered 550 years ago. To-day we had somewhat altered our adaptation of an old rule. In the old days men of science concerned themselves particularly with curative methods, discovering evil and trying to find a remedy for it. To-day we adopt the much more sagacious plan of preventing evils from arising. Take the instance of the evils that arise from want of sanitation, such as small-pox. He was told that there were to-day hundreds if not thousands of medical men who had never seen a case of small-pox, owing to the fact that the improvement in sanitation has made it a thing of the past. Only seventy years ago a report was presented to an authority within that very area recommending open conduits by way of sewers on the ground that the solid matter would be dried by the sun and dispersed by the wind. The Plumbers' Company to-day suggested more excellent ways of dealing with the problem, and it was because of the great improvement in their work that they sought to get the assistance and the sympathy of all professional men engaged in public health. Only in 1891 the late King, addressing an international congress of health, referred to certain diseases which were deemed to be preventible, and he made use of this remarkable expression, "And if preventible, why not prevented?" The plumbers' trade had been endeavouring by supplying mechanical appliances to show that certain diseases were preventible, and have by improved sanitation been prevented. This was the work the Plumbers' Company had been seeking to perform. They had suggested that the Legislature should step in and give them the right of registration—a similar right to that enjoyed by some other professions—so that they should be able to say, "This man is competent, and therefore registered," or "This man is incompetent, and therefore is rejected"; so that it should be possible to select men in whom the greatest confidence could be placed that the work would be done efficiently. The question was important because the plumber's work was important. An unskilled workman created the cause of offence, of trouble, of disease, of death, if his work were of an indifferent character. That being so, they asked all those occupying supervising positions—architects, engineers, water engineers, and so on—to employ only efficient workmen. The best way to distinguish the efficient from the inefficient was to establish a tribunal of fitness.

THE Electric Lighting Committee of Edinburgh Town Council recommend the Council to apply to the Secretary for Scotland for leave to borrow an additional 75,000*l.* in connection with the capital expenditure of the undertaking. The money is required principally for the condensing plant at Dewar Place.

THE Aspatria Urban District Council invite engineers to submit before June 10 plans and estimates of a scheme of sewerage and sewage disposal for their district. Applicants to state inclusive terms upon which they will undertake the work. The different schemes will be submitted to a competent engineer to adjudicate upon.

THE Ayr Race Committee have decided to remodel the half-crown stand at the new racecourse, which will be first demolished and a new and up-to-date stand erected in its place. The authorities have submitted plans to the Dean of Guild Court of Ayr, which has given its sanction for the structure. Work is to be proceeded with at once, and the cost will probably exceed 5,300*l.*

THE Local Government Board have appointed Major C. E. Norton, R.E., and Mr. Thomas Adams to hold an inquiry relative to the town planning scheme which the Corporation has prepared for approval for Harborne and Quinton. The inquiry will be opened at the Council House on January 4, at 10 A.M. All persons interested in the matter are invited to attend and give evidence.

PROFESSOR REGINALD BLOMFIELD, A.R.A., has been appointed to act as assessor in the forthcoming competition for a library and art gallery to be erected on the old infirmary site, Piccadilly, Manchester. The committee authorised on Wednesday the publication of advertisements for competitive designs. The competition will be open to all architects. From the designs sent in ten will be selected, to the author of each of which a sum of 100*l.* will be given. Mr. Reginald Blomfield, A.R.A., will act as assessor in conjunction with the official advisers of the Corporation. The author of the design finally selected will carry out the work on the usual commission.

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GUILD OF ARCHITECTS' ASSISTANTS.

A MEETING was held at Prince Henry's Room, Fleet Street, on December 13, Mr. J. H. Elder Duncan, Vice-President, in the chair. The Hon. Secretary read the correspondence which had taken place between the Guild, R.I.B.A., and the Society of Architects on the question of the inclusion of the assistant's interests in the provisions of the proposed Parliamentary Bills. Two proposals were suggested by the Guild:—(1) Registered practitioners to employ only registered assistants, and (2) restriction of the number of unpaid assistants and pupils in a registered practitioner's office. These proposals have been referred by the R.I.B.A. and the Society of Architects to their respective Sub-Committees dealing with the Bills. Mr. S. Douglas Topley, A.R.I.B.A., then read a paper on "Rational Building," in the course of which he drew attention to the deficiencies of the office-trained architect, too often a slave of his drawing implements. He thought the position of string courses on elevations was frequently determined by that of the tee-square on the board, and roof pitches governed by the set square.

He quoted an account of a meeting at the R.I.B.A. thirty-five years ago, in which the author, mercifully omitting names, described how the discussion circled round an assertion that lines one sixty-fourth of an inch in thickness produced the best results, and thought they were hardly likely to produce the western elevation of St. Paul's.

Art in building depended upon sound and reasonable construction. Photographs of work by Weir Schultz and Curtis Green were handed round to support this statement.

Mr. Topley favoured contract by schedule of prices, which enabled the architect to vary and improve the structure as it progressed.

He recommended a revision of architectural training, to include three years' workshop training, and suggested a certificate of the R.I.B.A. Final Examination should be evidence that the holder had mastered at least one craft.

He looked forward with perfect confidence to the time when the term "architect" would apply only to that man who, having acquired a thorough practical training in the workshop and a sound theoretical training in the college, went to his one job every morning and worked side by side with his assistant craftsmen.

Mr. J. H. B. Scott followed with a paper on "Difficulties of the Quantity Surveyor in Relation to the Architect." He said that quantity surveyors were greatly and unnecessarily annoyed by the "alleged" specifications of architects, and suggested that if the architect supplied the quantity surveyor with a general statement of requirements, accompanied by copious notes on the drawings, these, with the answered queries naturally arising from the taking-off, would form sufficient basis for the specification, for the writing of which the quantity surveyor should be paid in addition to his legitimate charges for the bills of quantities. But, as the specification is included in the architect's duties, Mr. Scott hesitated to suggest that the architect should pay for it out of his commission. The use of a "stock" specification was particularly deplored, and also the under-estimation of work by an architect, as also incomplete drawings and amendments thereto.

The lame attempts of some architects to adjust the final account, and the subsequent appeal to the quantity surveyor to re-assemble the *débris*, were movingly described. The lack of position of the quantity surveyor in the public eye, whilst the names of architects, builders, and even clerks of works basked in the sunshine on the monumental brasses affixed to buildings, was much lamented; and, in conclusion, the lecturer trusted that so important a factor in the production of architecture would obtain due recognition in the future.—Mr. J. V. Hibbert, F.S.I., proposed a vote of thanks to the readers of the two papers. He took exception to the practical side of the educational programme proposed by Mr. Topley. Design is imaginative, and without imagination there can be no architecture. He thought draughtsmanship overrated, and that public competitions fostered fine draughtsmanship but doubtful architecture.—Mr. J. F. Burkinshaw seconded. He said quantity surveyors often illegally poached upon the architect's preserves by making both drawings and quantities without a qualified architectural assistant, and they often caused unnecessary friction between the assistant and his principal.—The Vice-President (Mr. J. H. Elder Duncan) did not agree that the architect should understand the crafts in any other sense but that in which a leader of an orchestra understands all instruments, although he may not be able to perform on any one of them. The errors sometimes made in the course of design were well illustrated by an instance which had come to his notice. A novel stage was required for a certain playhouse, consisting of an enormous revolving tank on which yacht races could be represented. An immense number of detail drawings were turned out from the engineer's office. Progress was, however, suddenly arrested by the casual observation of an onlooker, that immediately the stage revolved the audience would be deluged. Contract by schedule of prices was more expensive, but very necessary when clients are troublesome and money is not a prime factor. He knew that architects often treat their quantity surveyors as uncongenial, but necessary.—Mr. G. Gerald Large, P.A.S.I., pointed out that if architects gave a true estimate of cost at the start they would probably lose their clients.—Messrs. Topley and Scott having briefly responded, and a special vote of thanks having been passed to the Vice-President for his occupancy of the chair, the meeting closed.

THE LEANING TOWER OF PISA.*

(*Continued from Dec. 9, Supplement p. 18.*)

The Theory of Accident Examined.

IT will be remembered, from the account of De Fleury's surveys (*The Architect*, October 7, 1910), that the advocate of the theory of accidental inclination, who understands his own case, is now obliged to hold with De Fleury, that an unequal settlement of the tower took place at the time when the first storey was nearing completion, and before the second storey was begun, because the second storey bends towards the perpendicular by an increment of 3 cm. in the height of the first gallery on the overhanging side, as compared with the opposite side. Similar successive unequal settlements are held to have occurred at each successive storey, and to have been rectified as they occurred, to the total amount of 0.86 m., by the use of similar successive increments. The rest of the unequal settlement is supposed to have happened shortly after the tower was finished, to the amount of 0.70 m.

Mothes, who follows De Fleury closely in this matter, gives a similar detailed account of these imaginary settlements. This theory has no historic or other record to support it, and is only based on the measures which show that the tower bends toward the perpendicular at each successive storey.

The Theory of Accidental Inclination Tested by the Spiral Stairway Construction.

If this theory has any value whatever it must now be applied to the measurements in the spiral stairway below the first gallery platform. If the changes of height and of dip in the stairway ceiling were not intended to increase the stability of an intentionally leaning tower, they must have been intended to combat the effects of unequal settlement in a given direction and that given direction must have been the line of greatest inclination in fig. 1. But the advocate of accident, who is obliged to hold that an unequal settlement of 3 cm. only had occurred when the first storey was finished, is now obliged to hold that a settlement in the same direction, and probably of less amount than 3 cm., had been observed when the thirteenth step, F, had been reached, and also that the builders knew that any further unequal settlement would continue in the same direction.

The theory of accident is involved in even greater absurdity than that, for it will next be shown that the system, so far explained from the thirteenth step upward as far as the forty-ninth step, has its inception at the first step of the construction.

The difference between the mean heights of the first and thirteenth steps is 0.44 foot, or 5½ inches (7.985-7.545). This decrease of mean height is largely due to a decrease in height on the outer side, i.e., to the decrease of the inward dip which begins at the first steps, and this fact is so significant that we quote here all the measures for the dip, between the first and thirteenth steps, inclusive. They run as follows:—0.31, 0.44, 0.49, 0.51, 0.48, 0.27, 0.16, 0.13, 0.13, 0.14, 0.14, 0.07, 0.03 foot.

There is therefore no doubt that the system of dip which rules beyond the twenty-fifth step, J, was experimentally

* An article in *The American Architect* of November 23, entitled "Brooklyn Museum Measurements of 1910 in the Spiral Stairway of the Leaning Tower of Pisa," contributed by Mr. Wm. H. Goodyear, M.A., Curator of the Department of Fine Arts, Museum of the Brooklyn Institute; hon. member Society of Architects of Rome; hon. member Edinburgh Architectural Association; hon. member Royal Academy of Fine Arts of Milan; hon. academician Royal Academy of Venice; corresponding member American Institute of Architects.

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begun at the first step, that the inward dip was also intended here as an expedient to forestall and correct any tendency to outward movement in the outer wall of the stairway, and that this inward dip was logically abandoned, or much decreased, near the upper side of the line of greatest inclination toward the south, where the inward inclination of the ceiling corresponds to the inward inclination of the step, when the height of the wall is the same on both sides of the stairway. Near this point, any great addition to the southward dip of the ceiling, already inherent in the leaning construction, was naturally held to be an undesirable expedient.

Thus since the spiral stairway has been measured, it is now necessary to hold, according to the present theory of accident, that the precautions which were intended to combat the *unequal* settlement of the building in a certain given direction *were initiated at the time when the building was begun* and immediately after the foundations had been laid. This must be believed in spite of the fact that the same theory is obliged to hold that the inequality of settlement was only 3 cm. when the first storey was finished. There may be people whose credulity will go thus far, but mine does not.

We have to consider here that the tower now stands in a well and that the upper north side of the tower is about 4 feet below the adjacent level, whereas the south side is about 9 feet below the adjacent level. In other words, the theory of accidental inclination has to assume a very remarkable direct settlement, besides the unequal settlement which caused the inclination.

De Fleury estimates the minimum direct settlement at nearly 8 feet (m. 2.40), *i.e.*, 8 feet on the upper side, believing that the depression of the immediately surrounding area, as compared with the level of the adjacent cathedral choir, was part of this settlement. Here, then, is a building which is supposed to have gone down 8 feet on the upper side and 13 feet on the lower side, and we are asked to believe that this settlement had begun immediately after the foundations were laid, and we are also asked to believe, although the inequality of settlement *was only* 3 *cm.* at the cornice of the first storey, *that the builders knew which way the ultimate and final inequality of settlement would lean the tower before the thirteenth step was reached.*

Certainly the sceptics as to intentional inclination are now obliged to swallow a very large camel and to strain at a comparatively small gnat.

The Dip in the Spiral Stairway of the Second Storey.

Fig. 1 shows measures for eight steps beyond the point of greatest overhang at H, up to the platform of the first storey, and fig. 2 shows the steps farther round the turn.

The rapid disappearance of the dip is to be first noticed. It is abandoned entirely at the sixty-second step, which is three steps lower than the quarter turn at fig. 2, F, west side. Just above that point the dip veers very slightly in the opposite direction and then continues, generally in the inward direction, but in slight amounts, around to the third gallery platform at fig. 2, I, which is the point of greatest overhang next above, fig. 1, G. There are fifty-seven steps between the sixty-second step near F and the third gallery, inclusive, and the greatest amount of inward dip in the entire series is 0.30 foot. The average is considerably less and eleven measures show a slight dip in the outward direction. The lack of system in the variations is also apparent.

Now, on the supposition that the experiment of building a leaning tower had so far proved a stable success, and that the anxieties attendant on the beginning of such a construction had disappeared, this abandonment of the systematic variations in the dip could be easily explained, because they must have given the masons a great deal of trouble.

On the supposition that the systematic variations in the dip, beginning at the first step and continuing as far as the sixty-second step, were intended to combat an unequal settlement, the abandonment of the system cannot be explained, because the settlement continued above the sixty-second step, if it took place at all.

Height of the Ceiling.

The decrease in the height of the ceiling is very marked beyond the forty-ninth step in fig. 1, up to the quarter turn at F, in fig. 2. As regards the mean height, the decrease from the forty-ninth step to the sixty-sixth step at F is 1.62 foot, or 1 foot 7½ inches (9.075—7.455). *The decrease in the outer measures is* 2 *feet* (9.44—7.44). The decrease in the inner measures is 1.24 foot, or 1 foot 3 inches (8.71—7.47).

Of still greater interest is the unbroken sequence in the decreasing numbers. Beyond the fifty-second step there is not a single break in the decreasing sequence of the measures for the outer or inner side or for the mean amount. This continuity of downward variation is an unimpeachable proof of the continuance and purpose of the system which begins at the first step of the stairway.

Thus in the sixteen steps, from the thirty-fourth to the forty-ninth, the mean height of the ceiling increases 1.89 foot, or 1 foot 11 inches, and it decreases from the forty-ninth step to the sixty-sixth, 1 foot 7½ inches in 17 steps.

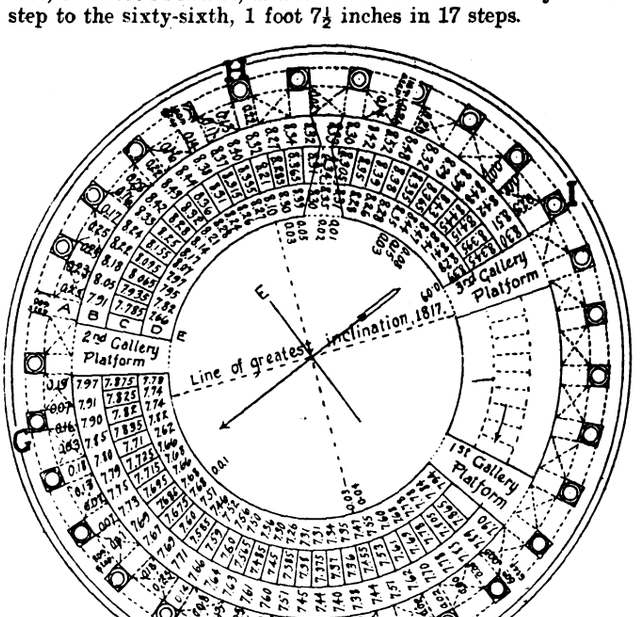


FIG. 2.—Brooklyn Museum measurements of 1910; for the heights of the spiral stairway between the platforms of the first and third galleries, inclusive. Measures in feet and decimals. Circle A is the exterior gallery. The measures in this circle represent the extra height of the outer wall of the spiral stairway as measured at the outside centre of each step and as compared with the inner wall. These measures consequently also represent the amount of downward dip of the stairway ceiling toward the inner wall. Circle B is the outer wall of the tower. In this circle are placed the measures for the height of the spiral stairway on the outer side as taken at the outer centre of each step. Circle C is the spiral stairway. The measures in this circle represent the average, or mean height, of the stairway at the middle centre of each step. These measures are obtained by halving the sum of the outer and inner measures. Circle D is the inner wall of the tower. The measures in this circle represent the inner height of the stairway at the inner centre of each step. In Circle E, beyond the line bounding the inner well of the tower, are the measures which represent the extra height of the inner wall of the stairway at the points where it is higher than the outer wall. They also represent, therefore, the relative dip downward and outward of the ceiling of the stairway when the heights of the inner and outer walls are compared at the given step. Measurements are omitted at the platforms, because the ceilings are flat, and they are also omitted at the steps adjacent to the platforms when the flat ceiling reaches over them.

We remember that the continuous increase of the dip up to the forty-ninth step began farther back, at the twenty-fifth step, with total increase 0.70 to the forty-ninth. Its decrease is of the same amount, but is completed before the quarter turn at F, fig. 2, is reached.

(To be concluded.)

THE CONCRETE INSTITUTE.

THE thirteenth ordinary general meeting of the Concrete Institute was held on Thursday, the 15th inst., at the Royal United Service Institution, Whitehall, London, S.W., Sir Henry Tanner (President) in the chair. A paper, of which an abstract follows, was read by Mr. Thomas Potter, M.C.I., on "General Concrete Practice."

Concrete practitioners in the past, engaged in building practice, appear, said the lecturer, to have kept their experience very much to themselves, except in connection with engineering works and specialities in connection with reinforcement for walls, floors, roofs, and similar purposes, which have been dealt with in a voluminous manner by specialists and patentees.

This paper, therefore, was confined to the use of concrete in connection with buildings, apart from any association with reinforcement or steelwork.

Theory and Practice.

Concrete and its application appear to set most theories at defiance—many that have been proposed hitherto, with every good reason for acceptance, have been negatived in practice.

No doubt eventually there will be much valuable information and data made common in connection with the use of concrete that may be relied on by the architect, builder, and

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clerk of works. At present the information available is not altogether of that character. For this reason treatises on concrete, written only a few years ago even, based principally on theoretical deductions, should be read with caution.

Its very simplicity has led to its abuse, for it has been, and is still often considered that anything nearest to hand—for instance, pit gravel of any description, broken stone and brickbats, mixed with all kinds of rubbish—will do for an aggregate, that the cheapest cement in the market is quite good enough for a matrice, and that the cleanliness of the water requires no consideration—anything will do. This is altogether wrong.

Labour.

Another factor is the human equation. The cement may be good, the aggregate of a suitable nature and well graded, and the water clean; but if the materials are not thoroughly mixed and the water not suitably proportioned, the value of the concrete is seriously diminished. Machine mixing remedies this to a great extent; but for many building purposes mixing machines do not seem as yet to find much favour. The mixing of concrete is not a favourite occupation with workmen; it is laborious work which can be lessened if the materials are not wrist-turned, but simply lifted in the shovel and deposited close at hand without being turned over. Workmen who are efficient as labourers in most directions are not always equally so as concrete workers.

In the lecturer's experience the better class of country labourers are by far the best for the purpose; they are willing, have no preconceived notions as to the fitness of things, and are tractable. Many town labourers are very much the reverse.

Suitable Aggregates.

The principal materials more or less adapted for aggregates are granite and other stone-quarry chippings, broken brick or tile-yard *debris*, burnt clay, slag from iron ore, flints, furnace or boiler ashes, coke breeze, and chalk.

Chalk would be rarely used in the ordinary way, more especially the top strata, which is soft, porous, and easily affected by frost; but it has been used where it was difficult to obtain any other except from a long distance. For small holdings in chalk districts no doubt good substantial dry walls can be made with chalk concrete where better aggregates cannot be obtained.

Coke Breeze.

Coke breeze as an aggregate is thought by many to be beneath notice. It was extensively used for many years, principally for floors, but it undeservedly lost its character some time since through a letter in the *Times* telling of its failure in Germany, where it had been prohibited. It was not stated, the lecturer believed, of what class of coal it formed the residue, and this is an important point. This letter was followed by others, telling how it was of such an inflammable nature that, if exposed to a severe fire, it was second only to coal in assisting combustion. Another letter stated that it disintegrated in the course of a few years and crumbled away. It seemed to be a case of giving a dog a bad name.

So far as its strength is concerned, Mr. Kirkaldy made some experiments for the West Ham Corporation some years since, with the following result: A brick pier 18 inches square and 18 inches in height, made with the best stock bricks and blue lias lime mortar, crushed at the end of two years with 46 tons per square foot; a similar pier of Harold Wood bricks and blue lias lime mortar crushed with 75 tons per square foot; another pier, made of six parts of coke breeze to one part of Portland cement, crushed with 131 tons per square foot.

As to inflammability, the tests made by the Fire Prevention Committee with various kinds of floors, each under similar conditions, exposed for three hours to an increasing and ultimate temperature of 1,900° F., and water played on them from a hose pipe, gave the following results: Coke breeze and burnt ballast equal and best; each was found, after being allowed to cool, practically free from cracks or deflection, and Thames ballast and granite chips the worst.

The lecturer said he had used some thousands of tons of coke breeze for floors, and did not remember a failure of any kind therewith. Coke breeze is condemned by many as an unsuitable aggregate; but, although it is not, taken altogether, the best material for floors and roofs, the lecturer has found it one of the best, though, like other materials, there are good, bad, and indifferent qualities.

(*To be concluded.*)

THE SOCIETY OF ENGINEERS.

The first annual general meeting of the Society of Engineers (Incorporated) was held on the 12th inst., at 17 Victoria Street, Westminster, Mr. Diogo A. Symons, M.Inst.C.E., President, in the chair.

The result of the postal ballot for the election of council and officers for 1911 was announced as follows:—

President, F. G. Bloyd; Vice-Presidents, J. Kennedy, A. Valon, H. C. H. Shenton; Members of Council, Professor Henry Adams, C. T. Walrond, Norman Scorgie, Percy Griffith, T. E. Bower, Henry C. Adams, J. R. Bell, S. Cowper-Coles, Frank Latham, and H. P. Maybury; Associate Member of Council, E. Scott Snell; Hon. Secretary and Hon. Treasurer, D. B. Butler.

It was announced that the Council had awarded the following premiums in respect of papers published in the *Journal* during 1910:—

The President's Gold Medal to Mr. W. C. Easdale, for his paper on "Sewage Disposal Ideals"; the William Clarke Prize, value 5*l.* 5*s.*, to Mr. S. M. Dodington, for his paper on "Public Slaughterhouses"; the Bessemer Premium, value 5*l.* 5*s.*, to Mr. C. W. V. Biggs, for his paper on "The Inspection and Testing of Engineering Materials and Machinery"; the Nursey Premium, value 3*l.* 3*s.*, to Mr. Henry C. Adams, for his paper on "Current Professional Topics"; a Society's Premium, value 3*l.* 3*s.*, to Mr. A. H. Allen, for his paper on "Electricity from the Wind"; a Society's Premium, value 3*l.* 3*s.*, to Mr. C. R. Enock, for his paper on "Engineers and Empire Development."

The Chairman presented the report of the Council, which showed that the formation of the Society, by the amalgamation of the Society of Engineers and the Civil and Mechanical Engineers' Society, had been fully justified by the success of the first year's work. Details were given of what had been accomplished and of the matters still occupying the Council's attention. The report stated that the incorporated Society combined the prestige of an old foundation with the strength and vitality of a modern institution, and concluded by thanking those who had given their active or moral support to the Society during the past year.

Votes of thanks to the Council and officers for 1910 and to the scrutineers were passed and acknowledged.

TRADE NOTES.

Messrs. Farrow & Jackson, Ltd., engineers to the wine and spirit, brewing trades, &c., 16 Great Tower Street, E.C., have been honoured by the Lord Steward with notification of warrant of appointment as makers of cellar fittings, &c., to His Majesty King George, in succession to the warrant held from his late Majesty and from Queen Victoria.

Among the novel features in building construction in Kingsway may now be seen a timeball which has been erected over the dome of Bensons' Advertising Offices, and is visible from Holborn and Aldwych. This timeball travels slowly up the mast ten minutes before each hour from 9.0 A.M. to sunset, and is released by signal from Greenwich exactly at the hour.

Messrs. Smith Major & Stevens, Ltd., electric and hydraulic engineers, Janus Works, Battersea, on Saturday last transferred the manufacture of their lifts to extensive new works at Northampton, where the manufacturing facilities have been greatly increased. All correspondence must be addressed to Abbey Works, Northampton. Attention to London customers will still be given by an efficient staff at Janus Works, Battersea, and requests addressed there for representatives to call, or other business, will receive prompt attention.

The Board of the Associated Portland Cement Manufacturers (1900), Ltd., have unanimously elected Lord St. Davids a director and chairman of the company, Mr. F. A. White having resigned the chairmanship in order that it might be offered to Lord St. Davids. Mr. White becomes a vice-chairman in the place of Mr. H. Osborne O'Hagan, who resigned his vice-chairmanship for the same reason, but retains his position on the board as a managing director. Mr. E. W. Brooks has resigned his vice-chairmanship in order that it may be available whenever it seems desirable to fill the vacancy, but retains his position as a managing director.

The Corporation of Edinburgh have issued an appeal for subscriptions towards the 8,000*l.* necessary to complete the sum of 75,000*l.* which will be eventually spent on the buildings and equipment of the Edinburgh Municipal College of Art.

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UNIVERSITY OF CALIFORNIA

THE

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**** Entered in the United States of America as second-class matter.*

AGENTS FOR AMERICA:

The International News Co., 5 Bream's Buildings, Chancery Lane, London, England, and New York.

AGENTS FOR CANADA:

Messrs. WM. DAWSON & SONS, Ltd., 91 Church Street, Toronto, to whom all correspondence for Subscription and Advertising Rates should be made.

Subscription $5.20.

AGENTS FOR AUSTRALIA, NEW ZEALAND AND TASMANIA:

Messrs. GORDON & GOTCH, Melbourne, Sydney, Brisbane, and Perth, Australia; Wellington, Christchurch, and Auckland, New Zealand; Launceston and Hobart, Tasmania.

SOUTH AFRICA: *Central News Agency, Ltd.*

NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

Special Position Spaces.—Unless ordered for weekly insertions the Proprietors cannot guarantee particular dates.

EDITORIAL NOTICES.

The Editor will always be pleased to examine drawings or articles with a view to publication, but cannot be responsible for the safety of those sent, though every reasonable care will be taken. Contributors desiring payment should clearly state their wishes. No payment will be made until after publication, and a commission to prepare articles or drawings does not necessarily imply acceptance or approval.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit the insertion of lengthy communications.

We have upon our staff a very eminent Barrister, who will be glad to answer in the columns of this paper any legal question that may be of interest to our readers. All letters must be addressed "Legal Adviser," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the nonappearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

ARGENTINE.—April 20.—A competition of plans for a hospital and school of medicine, to be erected at Rosario in celebration of the Argentine Centenary at a cost of about 149,000*l.* Prizes of 1,050*l.*, 700*l.* and 440*l.* will be awarded. A copy of the conditions, &c., may be seen by British architects at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C., where also a limited number of copies are available for distribution. Plans must be sent to the "Secretaria de la Comisión Pro-Hospital é Instituto de Enseñanza Médica del Centenario, Calle Córdoba 1230," Rosario.

BRADFORD.—The Board of Management of the Bradford Infirmary invite plans with estimates for a new infirmary in Duckworth Lane. Mr. Keith Young, F.R.I.B.A., will act as assessor. Deposit 3*l.* 3*s.*, which will be refunded on receipt of a *bona-fide* design or if block plan, instructions, &c., are returned within a month after receipt of replies to competitors' questions. The Secretary Superintendent of the Royal Infirmary, Bradford. (For further particulars see advertisement.)

COVENTRY.—March 1.—The Corporation contemplate the erection of municipal offices in the centre of the city, and also possibly a town hall, and accordingly invite competitive designs. Mr. E. Guy Dawber, F.R.I.B.A., will act as assessor. Deposit 2*l.* 2*s.*, which will be refunded on receipt of a bona-fide design or if the particulars are returned within fourteen days of receipt. Mr. Geo. Sutton, town clerk, 10 Hay Lane, Coventry. (For further particulars see advertisement, November 18.)



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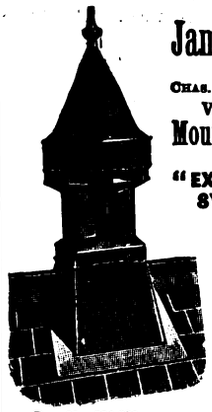
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CUBA.—April 15.—An international competition has been arranged for a Presidential Palace to be erected at Havana at a cost of about 205,000*l.* Premiums of 10,000 pesos and 5,000 pesos will be awarded. Conditions may be seen at the Cuban Legation, 3 Grosvenor Mansions, Victoria Street, S.W., or the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C.

GLASGOW.—Jan. 31.—The Corporation invite plans of a proposed branch library at the corner of Saracen Street and Allander Street, Possilpark. Premiums of 50*l.*, 30*l.* and 25*l.*, will be awarded. A plan of the site and conditions may be obtained free from Mr. A. W. Myles, town clerk, City Chambers, Glasgow.

LLANDRINDOD WELLS.—The Urban District Council invite competitive plans for a pavilion in the recreation ground. First and second premiums will be awarded by an assessor. Mr. D. C. Davies, clerk, Llandrindod Wells.

PENRITH.—Feb. 8.—The Governors of Queen Elizabeth's Grammar School, Penrith, are prepared to receive competitive designs for the erection of a secondary school, accommodating 200 students, with provision for the conduct of technical and evening classes. Premiums are offered to competing architects—viz., first, 50*l.*; second, 25*l.*; third, 10*l.* Printed instructions will be forwarded upon receipt of stamped addressed large-post official envelope. Mr. James Cropper, The Vicarage, Penrith, clerk to the Governors.

ROMFORD.—The Town Planning and Modern House and Cottage Exhibition at Gidea Park, Squirrels Heath, in the Romford Garden Suburb, summer 1911. Class IV.—Town plan of Gidea Park—prizes of 100*l.* and 50*l.* Class VII.—Open to builders. For excellence of workmanship and construction in the erection of a cottage in Class I. or II.—first prize, gold medal and 100*l.*; second prize, 50*l.* Final dates for designs; Class IV., March 31, 1911. Mr. Michael Bunney, A.R.I.B.A., hon secretary, 33 Henrietta Street, Strand, W.C.

TAUNTON.—Jan. 21.—The education committee invite architects, practising in the Borough of Taunton, to submit competitive designs for a provided school for 440 children. A block plan of site, together with conditions and instructions, may be obtained on application. No premium is offered, but the author of the selected design will have the carrying out of the work at 5*l.* per cent. Mr. George H. Kite, town clerk and clerk to the borough education committee, Municipal Buildings, Taunton.

CONTRACTS OPEN.

BEDLINGTON.—Jan. 10.—For erecting a Council school, to accommodate 568 scholars, at Bedlington Station, Northumberland. Send names and 2*l.* 2*s.* deposit by December 31 to Mr. C. Williams, secretary, Moothall, Newcastle-on-Tyne.

BELFAST.—Jan. 2.—For the construction of a coaling stage at their locomotive depot, Adelaide and Windsor Station, near Belfast, for the Great Northern Railway Co. (Ireland). The Chief Engineer's Office, Amiens Street Terminus, Dublin, and the District Engineer's Office, Belfast. Send 2*l.* to Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

BLACK NOTLEY.—Jan. 16.—For erection of a hospital at Black Notley, Essex, for the Braintree Joint Hospital Board. Mr. E. H. Bright, surveyor, Dodds Hall, Braintree.

BOURNEMOUTH.—Jan. 2.—For alterations to "Brading," Stafford Road, and other works in connection therewith, for the Town Council. Deposit 1*l.* 1*s.* Mr. F. W. Lacey, borough engineer.

BRENTFORD.—Jan. 3.—For certain repairs rendered necessary by the late fire at Clifden House, for the Urban District Council. Mr. J. W. Croxford, surveyor, Clifden House, Boston Road, Brentford.

BROMLEY.—Jan. 10.—For the extension of Bromley (Kent) post office, for the Commissioners of H.M. Works and Public Buildings. The Postmaster, Bromley (Kent) Post Office. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, London, S.W.

CANTLOP.—Jan. 6.—For the following works at Cantlop, five and a half miles from Shrewsbury, about two miles from Berrington Station, G.W.R., and about two miles from Condover Station, G.W. and L. & N.W. Railway, viz.:—(1) One new cottage; (2) five sets of new farm buildings; (3) alterations, additions and repairs to two existing homesteads; (4) alterations, additions and repairs to three existing cottages, for the Salop County Council. Mr. Wm. T. Hall, agent, College Hill, Shrewsbury.

CHARLTON KINGS.—Jan. 28.—For erecting cloakrooms at Charlton Kings Council school. Deposit 2*l.* 2*s.* Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

CHESTER.—Jan. 11.—For the erection of Chester new station sorting office. The Postmaster, Head Post Office, Chester. Send 1*l.* 1*s.* to H.M. Office of Works, Storey's-gate, S.W.

CLAYTON.—Jan. 3.—For the various works required in connection with the erection of shed for fire appliances, at the Union workhouse, Clayton, near Bradford. Mr. J. Harper Bakes, M.S.A., Calverley Chambers, Victoria Square, Leeds.

CLITHEROE.—Jan. 16.—For erection of a secondary school. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

CUDWORTH.—Jan. 12.—The West Riding Education Committee invite whole or separate tenders for the following works at Cudworth national school, viz.:—Alterations and repairs (builder, joiner, plumber and painter). Deposit 1*l.* The Education Architect, County Hall, Wakefield.

DARLINGTON.—Jan. 4.—For the reconstruction of premises in Printing House Square, occupied by Messrs. W. E. Dove & Co., Ltd., and others. Send names by Dec. 31 to Messrs. Hoskins & Brown, architects, Court Chambers, Darlington.

DONCASTER.—Feb. 1.—For the whole of the work in connection with the new institute, for the Trades and Friendly Societies' Institute, Ltd. Send names and 1*l.* 1*s.* deposit to Mr. F. Norman D. Masters, M.A., architect, Bank Chambers, Scot Lane, Doncaster.

EDINGLEY.—Jan. 9.—For erection of a parish hall at Edingley, Notts. Messrs. Saunders & Saunders, A.M.I.C.E., A.R.I.B.A., 24 Market Place, Newark.

FOURLANESEND.—Jan. 7.—For erection of a Council school at Fourlanesend, near Millbrook, Cornwall. The District Education Office, Saltash, or Mr. B. C. Andrew, architect to the committee, Biddick's Court, St. Austell.

GORLESTON-ON-SEA.—Jan. 21.—For erection of new buildings, for the East Anglian Institution for Blind and Deaf Children. Send in names and 2*l.* 2*s.* deposit by Jan. 1 to Mr. D. O. Holme, clerk to the Governors, Castle Chamber, Norwich. Mr. John E. Burton, architect, 57 London Street, Norwich.

HANDSWORTH.—Jan. 5.—The West Riding Education Committee invite whole or separate tenders for the erection of boundary wall (builder) at Handsworth Council School. The Education Architect, County Hall, Wakefield.

HORSHAM.—Jan. 4.—For the rebuilding of the Queen's Head Hotel, Queen Street. Messrs. Frederick Wheeler & Godman, architects, Bank Chambers, Horsham.

HOVE (SUSSEX).—Jan. 4.—For constructing an underground lavatory, south side of Livingstone Road, corner of Goldstone Street. The Borough Surveyor.

HUNSLET.—Jan. 7.—For the erection of moulding shop and reconstruction of roof. Deposit of 10*s.* for each contract, viz. bricklayer, &c., carpenter, slater, plumber, painter and steelwork. Messrs. Myers-Beswick & Partners, engineers, 8 Park Square, Leeds.

KEIGHLEY.—For erection of a detached residence at Brown Lane, Black Hill. Messrs. R. B. Broster & Sons, architects and surveyors, Craven Bank Chambers, Keighley.

LONDON.—Jan. 4.—For erection of Poplar new branch post office, for the Commissioners of H.M. Works and Public Buildings. Deposit 1*l.* 1*s.* Mr. J. Rutherford, 22 Carlisle Place, S.W.

LONDON.—Jan. 9.—For structural repairs at Nos. 403-9 Mile End Road, E., for the Whitechapel Guardians. The Clerk, 74 Vallance Road, Whitechapel, E.

LONDON.—Jan. 9.—For the renewal of the zinc roof on a portion of the Vallance Road Infirmary, for the Guardians of Whitechapel Union. The Steward of the Infirmary, 74 Vallance Road, N.E.

LYDBROOK.—Jan. 28.—For the carrying out of alterations and additions to Joys Green Council school, near Lydbrook. Deposit 2*l.* 2*s.* Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

NANTWICH.—Jan. 16.—For the supply of materials and for daywork labour required in the carrying out of certain works, being alterations and additions to the dwelling-houses and farm buildings known as Batherton Dairy House and Batherton Hall, near Nantwich, Cheshire. The County Estate Office, 49 Northgate Street, Chester, and at the Estate Office, Broad Lane, Nantwich.

NEWTON ABBOT.—Jan. 3.—For erection of additional wards at the infirmary. Deposit 2*l.* 2*s.* Mr. Samuel Segar, 24 and 26 Union Street, Newton Abbot, Devon.

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Newark.—Jan. 2.—For renewing stone steps and landings on principal staircase, renewals and repairs to stone steps in front of town hall, and new urinals, w.c., and paved floors in above building. Mr. George Sheppard, borough surveyor.

Oldham.—Jan. 10.—For the various works required in the construction of a pumping station, comprising engine-house, workshop, store-room, &c., together with boundary wall and other works in connection therewith, to be erected at Butterworth Hall, Milnrow, for the Oldham Waterworks Committee. Deposit 2*l*. Mr. Charles J. Batley, M.I.C.E., Piethorn, Newhey.

Ponteland.—The Newcastle-upon-Tyne Guardians invite persons desirous of tendering for the erection of a wash-house at the Cottage Homes, Ponteland, to send in their names at once. Mr. Gladstone Walker, Clerk to the Guardians. Union Offices, 127 Pilgrim Street, Newcastle-upon-Tyne.

Pudsey.—Jan. 7.—For erection of United Methodist Sunday school and institute. Deposit 10*s*. Mr. W. Hugill Dinsley, architect, Chorley, Lancs.

Scarborough.—Jan. 5.—For the construction of an engine house, &c., at the Cayton Bay Pumping Station. The Water Engineer's Office, Town Hall, Scarborough.

Scotland.—Jan. 14.—For erection of three boat slips at (1) Port an Uidh, (2) Caolis, and (3) Vatersay Bay, in the island of Vatersay, Barra, and in Saltavig Bay, near Lochboisdale, South Uist. Mr. Walter G. Coles, F.S.I., engineer, Scottish Office Engineering Department, 122 George Street, Edinburgh; or of Supervisor Monk, Castlebay, Barra, and Supervisor Coull, Lochboisdale.

Staines.—Jan. 13.—For supplying about 1,600 yards of unclimbable wrought-iron railing and gates, together with a short length of ornamental wrought-iron fencing with entrance gates, and erecting the same upon ground to be laid out as a cemetery. Mr. E. J. Barrett, A.M.I.C.E., surveyor, Town Hall, Staines.

Staines.—Jan. 13.—For the laying out and planting of about 4½ acres of ground to be used as a cemetery, for the Staines Urban District Council. Mr. E. J. Barrett, A.M.I.C.E., surveyor, Town Hall, Staines.

Stockport.—Jan. 3.—For construction of butchery department, Lowfield Road branch, for the Stockport Industrial and Equitable Co-operative Society, Ltd. Deposit 10*s*. 6*d*. Messrs. Wrathmell & Blackshaw, architects, Queen's Buildings, St. Peter's Square, Stockport.

Wales.—Jan. 5.—For erection of two pairs of cottage homes for children at Llwydcoed, Aberdare, for the Guardians of Merthyr Tydfil Union. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

Wales.—Jan. 9.—For erection of twenty or more dwelling-houses at Carnetown, Abercynon, for the Salisbury Building Club. Mr. Treharne Jones, architect and surveyor, Nelson, via Cardiff.

Wales.—Jan. 13.—For erection of a fire station at Ferndale, Glamorgan, for the Rhondda Urban District Council. Deposit 1*l*. 1*s*. The Council Offices, Pentre, Rhondda.

Walton-le-Dale.—Jan. 3.—For the construction of the following works in connection with the new pumping station, near School Lane:—Contract No. 1, erection of an engine-house and boundary wall. Deposit 2*l*. Mr. James Leigh, Council Offices, Bamber Bridge.

Wigan.—Jan. 4.—For the construction of dressing boxes, &c., at the Public Baths, Millgate. The Office of the Borough Engineer, King Street West, Wigan.

Winchester.—Jan. 16.—For the supply and fixing of deal and other office fittings at the new County Council offices, Castle Avenue. Deposit 5*l*. 5*s*. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Wombwell.—Jan. 12.—The West Riding Education Committee invite whole or separate tenders for the following works at Wombwell, Broomhill Council school, viz. alterations, &c. (builder, joiner, slater, plumber, painter and asphalter). The Education Architect, County Hall, Wakefield. Deposit 1*l*. Sealed tenders, properly endorsed, and addressed to the Clerk of the County Council, County Hall, Wakefield, must be received by 10.30 a.m. on January 12.

Yorks.—Jan. 5.—For the following works, for the Education Committee of the East Riding County Council, viz.:—(*a*) Erection of a Council school for girls and infants, with accommodation for 520 children at Norton (Malton); (*b*) erection of a Council school for 202 children and teacher's house at Welton. The Building Surveyor, County Hall, Beverley.

York.—Jan. 9.—For the erection of new stores in Railway Street, for the York Equitable Industrial Society, Ltd. Deposit 2*l*. 2*s*. Mr. H. B. Beck, 28 High Street, Doncaster.

TENDERS.

BLACKBURN.

For the construction of main sewers and the extension of the sewage outfall works at the Epileptic Colony, Langho. Mr. Fred W. Duckworth, engineer and surveyor, Blackburn.

Turner	£1,837 9 2
Wellerman Bros.	1,652 7 10
Sugden	1,517 18 0
Knowles & Winter	1,504 5 4
Whittaker & Sons	1,492 0 0
Fecitt & Sons	1,491 0 0
Cronshaw & Sons	1,488 0 0
Jenkins & Son, Blackburn (*accepted*)	1,400 0 0

BRIGHTON.

For the rebuilding of No. 7 Gloucester Place, for the Town Council. The Borough Surveyor, Brighton.

Bostel Bros.	£780 0 0
Penfold	759 0 0
Field & Cox	757 0 0
Burrage	749 10 0
J. & W. Simmonds	740 0 0
Gates & Sons	729 10 0
Tidey & Co.	668 10 0
Read, Brighton (*accepted*)	654 0 0

CARLTON.

For branch premises, Gedling Road, Carlton, Notts, for the Netherfield Co-operative Society, Ltd. Mr. Walter H. Woods, architect and surveyor, Long Eaton, near Nottingham.

Barlow & Son	£993 10 0
Short	955 0 0
Lewin	948 10 0
Loach, Station Road, Carlton (*accepted*)	924 0 0
Harper	923 0 0

CHARLES.

For erection of house and offices for the Baptist Church at Brayford, in the parish of Charles, North Devon. Mr. Thomas Carnell, architect.

Sanders & Son	£644 18 0
Slee & Son	567 2 10
Holcombe & Son	538 10 0
Hammet Bros.	509 17 0
Webber & Ley	497 0 0
Rice & Ley	494 14 0
Hancock & Huxtable, Stoke Rivers (*accepted*)	490 0 0

DUDLEY.

For constructing workhouse sewage disposal and drainage works. Mr. Stanley C. Eagles, C.E., engineer to the Guardians.

Guildhall Engineering and Decorating Co.	£1,349 0 0
Lewis & Martin	1,347 0 0
Hughes	1.323 1 3
Wood	1,300 0 0
Trentham	1,281 10 0
Harris & Son	1.275 15 6
Thorpe	1,268 16 1
Edwards	1,199 4 6
Law & Co.	1,196 2 0
Taylor & Co.	1,190 14 2
Hill & Co.	1,124 14 3
Farley	1,093 16 5
Meredith	1.055 0 0
Guest & Son	1,020 0 0
Crump, Dudley (*accepted*)	959 3 6

HAYES.

For erection of an entrance lodge to their works in Printing House Lane, for Messrs. Harrison & Sons, 45 St. Martin's Lane, W.C. Messrs. Hayward & Maynard, architects, 14 John Street, Adelphi, W.C.

Fairhead & Son	£915 0 0
Bollom	846 0 0
Dickens	843 0 0

LOUGHTON.

For constructing a bacterial filter at the sewage disposal works. Mr. Horace White, surveyor to the Council.

Jackson	£1,208 12 2
Paul	1,110 0 0
Manders	1,095 0 0
Bell & Sons	1,019 0 0
W. & C. French, Buckhurst Hill (*accepted*)	998 0 0

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LONDON.

For installing electric light at Salway Place schools, Stratford, E., for West Ham Education Committee. Mr. WILLIAM JACQUES, A.R.I.B.A., architect.

	Stannos.			Simplex.		
Simmons & Co.	£280	0	0	238	0	0
Ryan & Son	270	0	0	210	0	0
Weston & Sons	230	0	0	159	10	0
Halsey	223	0	0	178	10	6
Newbald & Co.	220	0	0	199	0	0
Johnson & Phillips	217	0	0	204	10	0
Mayfield & Co.	200	18	2	185	4	3
King	—			273	14	6
Mell	180	10	0	195	10	0
Morgan	149	0	0	151	10	0
West Ham Electricity Department, Stratford	190	17	0	*146	2	0

* Accepted.

NEW R.I.B.A. REGULATIONS FOR COMPETITIONS.

THE R.I.B.A. Regulations for Architectural Competitions, revised and amended in accordance with the resolutions passed by the general body at the meeting of November 21, have now been issued as an Institute paper and the old regulations withdrawn. The new regulations (which are not intended to apply to small limited private competitions) are as follows:—

It is assumed that the object of the promoters is to obtain the best design for the purpose in view. This object may best be secured by conducting all competitions upon the lines laid down in the following regulations, which have been framed with a view to securing the best results to the promoters with scrupulous fairness to the competitors.

Members of the Royal Institute of British Architects and allied societies do not compete excepting under conditions based on these regulations.

The conditions of a competition shall contain the following regulations (*A*) to (*F*) as essential:—

(*A*) There shall be appointed for every competition one or more fully qualified professional assessors, to whom the whole of the designs shall be submitted.

(*B*) No promoter of a competition, and no assessor engaged upon it, nor any employé of either, shall compete, or assist a competitor, or act as architect, or joint architect, for the proposed work.

(*C*) Each design shall be accompanied by a declaration, signed by the competitor, or joint competitors, stating that the design is his or their own personal work, and that the drawings have been prepared under his or their own supervision. A successful competitor must be prepared to satisfy the assessor that he is the *bona-fide* author of the design he has submitted.

(*D*) The premiums shall be paid in accordance with the assessor's award, and the author of the design placed first by the assessor shall be employed to carry out the work, unless the assessor shall be satisfied that there is some valid objection to such employment, in which case the author of the design placed next in order of merit shall be employed, subject to a similar condition. The award of the assessor shall not be set aside for any other reason.

(*E*) If no instructions are given to the author of the design selected by the assessor to proceed within twelve months from the date of the award, then he shall receive payment for his services in connection with the preparation of the competition drawings of a sum equal to 1¼ per cent. on the amount of the estimated cost. If the work is subsequently proceeded with, the 1¼ per cent. previously paid to him shall form part of his ultimate commission.

(*F*) The selected architect shall be paid in accordance with the Schedule of Charges sanctioned and published by the Royal Institute of British Architects.

1. The promoters of an intended competition should, as their first step, appoint one or more professional assessors, architects of established reputation, whose appointment should be published in the original advertisements and instructions. The selection of an assessor should be made with the greatest possible care, as the successful result of the competition will depend very largely upon his experience and ability.

The President of the Royal Institute of British Architects is always prepared to act as honorary adviser to promoters in their appointment of assessors.

2. The duties of an assessor are as follows:—

(*a*) To confer with and advise the promoters on their requirements and on the questions of cost and premiums to be offered.

(*b*) To draw up instructions for the guidance of competitors and for the conduct of the competition, incorporating the whole of the clauses of these regulations which are applicable to the particular competition.

Note.—It is essential in drawing up the instructions to state definitely which of the conditions must be strictly adhered to, under penalty of disqualification from the competition, and which of them are optional.

(*c*) To answer queries raised by competitors within a limited time during the preparation of the designs, such answers to be sent to all competitors.

(*d*) To examine all the designs submitted by competitors and to determine whether they conform to the conditions and to exclude any which do not.

(*e*) To report to the promoters on the designs not so excluded and to award the premiums in strict adherence to the conditions.

3. Competitions may be conducted in one of the following ways:—

(*a*) By advertisement, inviting architects willing to compete for the intended work to send in designs. For competitions for public works of great architectural importance this method is recommended.

(*b*) By advertisement, inviting architects willing to compete for the intended work to send in their names by a given day, with such other information as they may think likely to advance their claims to be admitted to the competition. From these names the promoters, with the advice of the assessor, shall select a limited number to compete, and each competitor thus selected shall receive a specified sum for the preparation of his design.

(*c*) By personal invitation to a limited number of selected architects to join in a competition for the intended work. Each competitor shall receive a specified sum for the preparation of his design.

Note.—Where a deposit is required for supplying the instructions it shall be returned on the receipt of a *bona-fide* design, or if the applicant declines to compete and returns the said instructions within a month after the receipt of replies to competitors' questions.

4. The number, scale and method of finishing of the required drawings shall be distinctly set forth. The drawings shall not be more in number, or to a larger scale than necessary to clearly explain the design, and such drawings shall be uniform in size, number, mode of colouring and mounting. As a general rule a scale of 16 feet to 1 inch will be found sufficient for plans, sections and elevations, or in the case of very large buildings a smaller scale might suffice.

Unless the assessor advises that perspective drawings are desirable, they shall not be admitted.

5. No design shall bear any motto or distinguishing mark; but all designs shall be numbered by the promoters in order of receipt.

6. A design shall be excluded from a competition—

(*a*) If sent in after the period named (accidents in transit excepted); (*b*) if it does not give substantially the accommodation asked for; (*c*) if it exceeds the limits of site as shown on the plan issued by the promoters, the figured dimensions on which shall be adhered to; (*d*) if the assessor shall determine that its probable cost will exceed by 10 per cent. the outlay stated in the instructions, or the estimate of the competitor, should no outlay be stated. If the assessor be of opinion that the outlay stated in the instructions is inadequate, he shall not be bound in the selection of a design by the amount named in such instructions, but the question of cost shall nevertheless be a material element in the consideration of the award; (*e*) if any of the conditions or instructions other than those of a suggestive character are violated; (*f*) if a competitor shall disclose his identity or attempt to influence the decision.

7. All designs and reports submitted in a competition for a public building, except any excluded under Clause 6, shall be publicly exhibited after the award has been made, which award shall be published at the time of exhibition; and all designs and reports submitted in a competition for a private building shall be similarly exhibited to the competitors.

8. All drawings submitted in a competition, except those of the design selected to be carried out, shall be returned to the competitors.

The usual R.I.B.A. scale of charges for assessing competitions, whether by jury or otherwise, is the sum of thirty guineas, plus one-fifth per cent. upon the estimated cost of the proposed building.

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THE CONCRETE INSTITUTE.*

(*Concluded.*)

Ashes.

One of the best aggregates for most purposes is ashes from locomotive boilers. It contains no impurities, is obtainable at most railway stations, and is inexpensive; but one company (the London and South-Western) allow their engine drivers when passing through a lias limestone district to use fragments of limestone in the furnaces to economise the coal consumption, but it is not very perceptible among the ashes, and does not slake, perhaps for some time after the concrete has been in place, but when it does it entirely ruptures the concrete. Floors and stairs have had to be entirely reconstructed as a result. It is believed no other railway company sanctions this, but where locomotive ashes are employed inquiry should be made relative thereto.

Plaster of Paris.

As is well known, plaster of Paris was used as a matrice previous to the employment of Portland cement. Where alterations have been made to buildings with floors of this description, the old concrete has sometimes been re-used as an aggregate, with the result that expansion has taken place and the concrete been ruined.

Aggregates that have passed through fire are charged more or less with sulphur, and slag from iron ore more than any other. The only way to liberate the sulphur seems to be to expose it to the atmosphere for as long a period as possible. Slag that had been aerated for a long period has made concrete less susceptible to change of form than any other aggregate.

United States Government tests have proved that the carbonate of lime, which forms so large a constituent of Portland cement, neutralises the effect of sulphur in aggregates to a great extent.

Parts of Aggregates Equivalent to Sand.

It is usual to specify that the sandy and dirty element in some aggregates shall be screened out and replaced by coarse, sharp sand; but it is difficult to understand the object of this. The coarse, sandy element of suitable aggregates, such as slag, furnace ashes, brick *débris*, or crushed stone chippings, is every way as good as pit or Thames sand, but it is desirable to eliminate the portion below the size of coarse sand, and apparently it is considered impracticable to remove one without the other; but, according to the lecturer's experience, it is more economical and effectual to wash out the fine dirty and dusty particles and leave in the coarse sandy ones. River gravels, as a rule, contain sufficient, and a stone crusher can be set to reduce any material to make quite enough for the purpose.

Grading Aggregate.

The size of the aggregate has long been a disputed point, but United States Government tests have proved that, no matter the purpose for which it is used, the coarser the aggregate, provided perfect homogeneity or denseness is secured, the stronger the concrete. The size, however, depends upon the nature of the work. A very coarse aggregate, so that it is graded by intermediate sizes down to that of coarse sand, would be the best for wide and deep foundations, but far too coarse for floors, roofs, walls, or partitions—it depends entirely upon their thickness.

It has been attempted to standardise the size of aggregates for various purposes, but Mr. Potter submitted that it is impossible. It depends entirely upon good grading, and there are few materials which come to hand in their natural state, or converted by a crusher, that are well graded.

Cleanliness.

The cleanliness of the aggregate is another factor of the greatest importance. Most aggregates are unclean, except, perhaps, river gravel from a quick-running stream. Very few pit gravels are clean, and, as a rule, they are the most difficult to wash; they are usually mixed with unctuous clay, which is difficult to get rid of and which is injurious to cement. If clean, the particles are usually of a rounded shape, the result of attrition at some former period, and not a desirable one for an aggregate.

It may be thought that quarry waste, brick-yard *débris*, slag, and materials generally that have passed through fire are quite free from deleterious matter, but they are not. If they have passed through fire and been broken by hand, or by a stone crusher, the particles will be found covered with a fine impalpable dust, almost imperceptible. If washed in a tub, as an experiment, and kept well stirred, the water will be charged to a considerable extent with this dusty element, which is injurious to cement.

Practically nearly all aggregates are very much improved by washing, which is an economic process if measured by strength.

Mixing Concrete.

The aggregate and matrice should be turned over twice dry, and twice while water is being added, and never less; the more they are mixed the better the concrete, and the more readily the various sized particles find their respective positions in the mass.

For many years it was advocated that only as much water should be used as will coat the aggregate with the cement and render the concrete of a sticky character. Actual practice is convincing enough to prove that this is wrong. The particles of the aggregate do not slide easily into place, and the concrete is not dense. But if the concrete is in a sloppy condition, better homogeneity or denseness is the result. It is almost needless to say that the water used in mixing concrete should be clean; if otherwise, it is equal to using an unclean aggregate.

Plums or Packing.

What are known in the United States as "plums," but which the lecturer has always called "packing," are pieces of broken stone or quarry waste, or other suitable materials of considerable size, embedded in the soft concrete as the work proceeds. Packing may be any size so long as it does not reach the vertical faces of foundations or monolithic walls by at least 2 inches and the particles are kept apart at least 2 inches, and are well rubbed in the soft mass, not merely laid on the concrete. Obviously the material must be clean. Some practitioners claim that packing adds to the strength of concrete, and, if carefully dealt with, it certainly does not diminish it, and lessens the cost.

Concrete Walls.

The disadvantage of building monolithic concrete walls is the cost of the forms or shuttering necessary for forming the troughs in which the concrete is to be deposited. In some cases it is common knowledge that it has cost as much as the concrete. In addition, unless it forms a backing to stone or brickwork, it has to be cemented or rough-cast externally, so that the cost is often more than brickwork.

For buildings of some magnitude—of a plain character, free from irregularities of plan, and of a simple design, such as warehouses, farm buildings, and factories—it can be used in most cases to advantage, so far as regards cost, while it possesses much greater strength and durability and freedom from the necessity of repairs—more so than ordinary brick walls. It is too early to affirm how long monolithic Portland cement concrete buildings are going to last, but there is not much doubt on that point. The oldest in this country probably does not exceed forty-five to fifty years.

We are told at times that plastered concrete walls are subject to condensation; but they are not more so than walls of stone or brick, or as much, with the further advantage that, after a period of six months or thereabouts, condensation very rarely occurs in an ordinary house, owing to the walls being of a more equable temperature. The concrete walls of a public building, when the latter is crowded, may give evidence of condensation, but that does not come within my experience.

As a hygienic material, concrete is superior to any other. If we go into the rooms of a brick house after they have been shut up for some time, there is often a musty, fungusy smell prevailing. In a concrete house or cottage, after being closed for a time, this is never found. The rooms in a well-built concrete house are cooler in summer and warmer in winter than those of a brick house, as concrete walls are more equable in temperature owing to being non-absorbent, and not so readily chilled as brickwork.

The Future of Concrete.

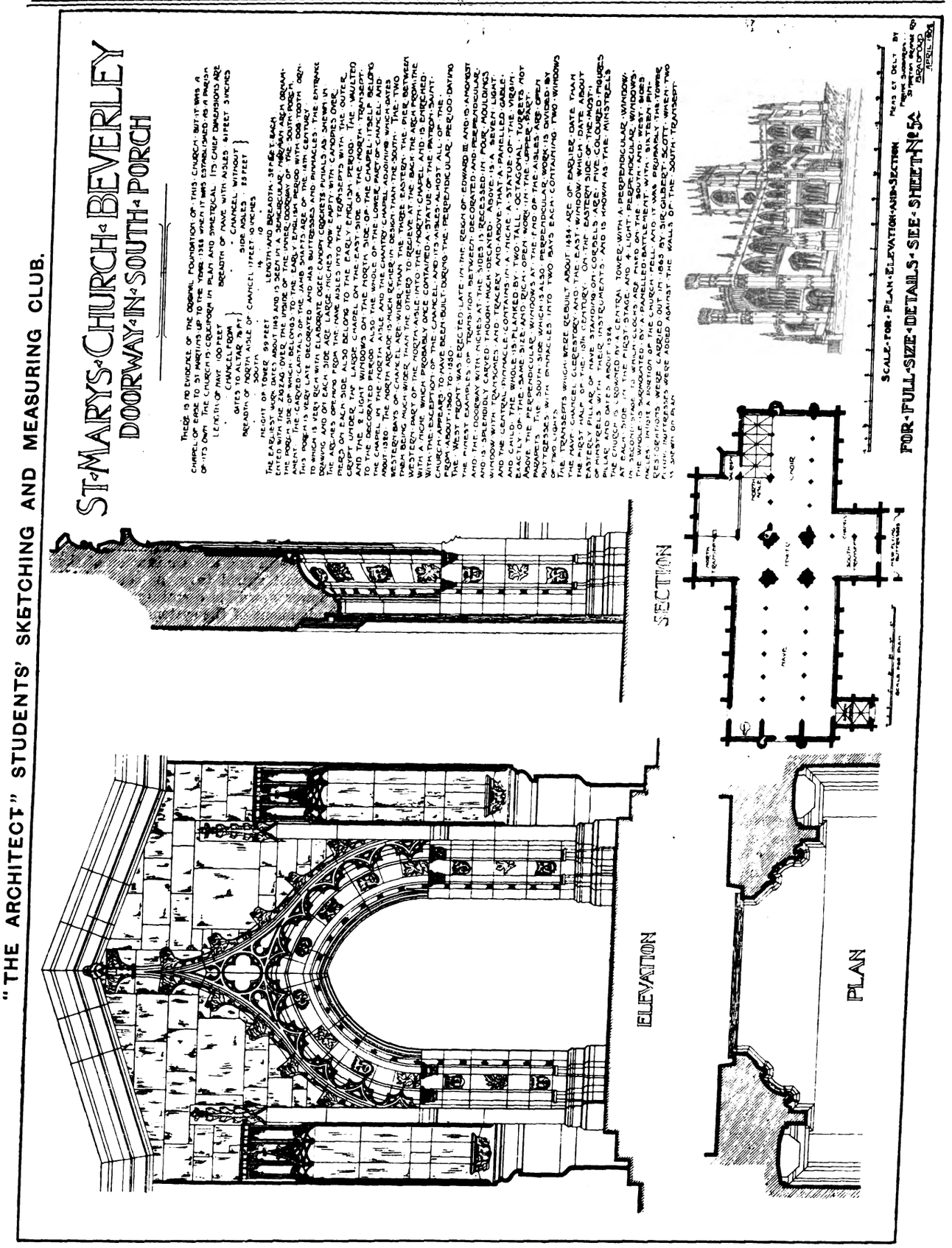
With regard to the future of concrete for buildings and allied purposes in large towns, its present use seems to indicate that it will be confined principally to floors and roofs, and in connection with skeleton steel-frame construction, and certain purposes for which cement and granite chips can be employed, such as pavings, steps, stairs, sills, lintels, etc. Monolithic reinforced walls will possibly not find much favour; there is the difficulty of external surface treatment, the cost of temporary forms, and minor difficulties which would not occur in most districts. In the country there should be more scope for the use of concrete. Eventually concrete building may be, and should be, a distinct occupation. The walls of factories, workshops, warehouses, and a similar class of buildings where no great architectural

* Abstract of a paper by Mr. Thomas Potter on "General Concrete Practice."

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SUPPLEMENT

"THE ARCHITECT" STUDENTS' SKETCHING AND MEASURING CLUB.



efforts are needed, and which are simple in plan and arrangement, can be built at a less cost than with brick or stone, and for farm buildings it is still better adapted, as it is applicable not only to walls, but to pavings for livestock places and for floors, and almost the entire fitments. Mangers, feeding-troughs, water-troughs, tanks for storing rain-water, stable stall divisions, channel gutters, and manure pits are all better executed with concrete than with any other material, and at a less cost.

Buildings of this class are practically free from the farmer's enemies, rats and mice, or can be made so with a little care. Rats, the most cunning of rodents, very much dislike concrete buildings. They can bore their way through a brick wall, but they never attempt to practise on a well-constructed concrete wall, and are averse to occupying buildings that afford no better retreat than open doors and harbours of refuge which are not out of reach of man and dog. On hygienic grounds it is superior to most other materials for farm buildings. Healthy surroundings are almost as much a necessity for cattle as for human beings.

For cottages and buildings for small holdings it is also well adapted. Where low-lying grass lands and meadows are intersected by running streams there is a necessity for foot-bridges, cattle bridges, sluices, hatchways, sheep-ways, etc., and for which there is nothing can compare with concrete for economy of cost and durability.

Discussion followed the reading of the paper, in which Mr. E. Fiander Etchells, Mr. S. Bylander, Mr. R. W. Vawdrey, Mr. E. Wait, Mr. Henry Puplett, Mr. L. Serraillier, and Sir Henry Tanner took part.

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MR. E. SEWARD *v.* THE CARDIFF CITY COUNCIL.

(Continued from last week.)

SOME references to the scheme in a periodical were read by Mr. Pollock, these containing some incidental views concerning the architectural interiors of churches and the relation of the parts to each other.

The Official Referee said it was news to him that the cruciform arrangement in churches was dominated by the question of mere convenience, as suggested by the writer.

Mr. Francis Williams: That was apparently written by a man who has never been inside a church. (Laughter.)

Mr. Pollock said he understood the curator was responsible for the article. (Renewed laughter.)

Further evidence was given on behalf of the defendants' case by Mr. Alderman Renwick, of Cardiff, and Dr. Charles Stanford Vachell, of Cardiff, who deposed as to what they alleged transpired at the committees. They said that a 150,000*l.* scheme was not considered in 1905.

Mr. William Woodward, F.R.I.B.A., of Messrs. William Woodward & Sons, architects and surveyors, of 13 Southampton Street, Strand, stated that he had been in practice as an architect for thirty years. He had carried out large buildings in London, including the Piccadilly Hotel. He had inspected the drawings prepared by Mr. Seward. In his view the scheme was unquestionably that of Mr. Ward's, and so far as he could gather from the evidence and the correspondence Mr. Seward did not appear to have done more than carry out the scheme of Mr. Ward. He was of opinion that during the preparation of the drawings Mr. Seward was informing himself at the hands of Mr. Ward as to what was right and proper for the museum design. In his opinion Mr. Seward was not justified in separating a group of drawings into three sets. They were one set. He considered that in these various plans the ordinary variations in them were consequent upon the advice of Mr. Ward. On the 30,000*l.* scheme relating to Cathays Park he thought Mr. Seward was entitled to 750*l.* or 2½ per cent. An architect should prepare half-inch details anticipatory of having to carry out the work eventually. However, he would allow Mr. Seward something in respect to them. He should think Mr. Seward had an unusual number of interviews with his clients, and for the preparation of those anticipatory half-inch details he thought Mr. Seward was entitled to 100*l.*

Mr. Woodward said that in hotel architectural work he had carried out he had consulted with the authorities and discussed with them scheme after scheme until schemes were arrived at satisfactory to his clients. He should be ashamed to take a single shilling for those sets of plans of which his clients had not approved.

Mr. Pollock, cross-examining, asked if Mr. Norman Shaw had not had something to do with the designing of the Piccadilly Hotel.

Mr. Woodward replied that the Piccadilly Hotel was originally designed by himself and Mr. Emden. Then Mr. Emden retired, and Mr. Gruning joined him as co-architect. Mr. Norman Shaw was appointed by the Treasury to design the Quadrant in Regent Street, of which the Piccadilly Hotel in Regent Street formed a part. Therefore he (witness) had to work with Mr. Norman Shaw and get out separate drawings in consequence of the alterations in the elevations that were prepared by Mr. Norman Shaw. Witness made no extra charge, for what he did was included in his 5 per cent. on an outlay of 400,000*l.*

Cross-examined: He considered that for the whole of the work from December 1901 until the present time Mr. Seward was entitled to 850*l.*, which would cover all.

Mr. Pollock: Supposing you had prepared your plans for the Piccadilly Hotel, and the work had not been carried out, would you have had any claim?

Mr. Woodward replied that he would have had 2½ per cent. on the 400,000*l.* Continuing, he said he thought he was justified in saying that the conception of this design—the portions determined to be built and the rest that were not completed—belonged to Mr. Ward.

Could you understand Mr. Hall's evidence in this case? asked Mr. Pollock.—Witness: I understood it perfectly, but I differ with him entirely. The witness added that he was more familiar perhaps with this case because he had been concerned in it for months and was aware of all the interviews between Mr. Ward and Mr. Seward. If Mr. Hall had been similarly situated he might have come to different conclusions.

The Official Referee: He would have given the decision which you would give, and which I ought to give. (Laughter.)

In further cross-examination, the witness thought that Mr. Seward's specification for a 25,000*l.* building ought to have been double the length.

Evidence was also given by Mr. Arthur Harrison, F.R.I.B.A., of Colmore Row, Birmingham, who held that Mr. Seward was not entitled to the charges he claimed.

At the close of evidence on behalf of the defendants' case,

Mr. Pollock called a Cardiff reporter to show that there was allusion to a 150,000*l.* scheme at the meeting of the committee on February 1, 1907.

Legal arguments were reserved until next sittings.

THE LEANING TOWER OF PISA.*

(Concluded.)

Height of Ceiling to Third Gallery Platform.

THE variation in mean height in the next quarter turn, from F to G, the point opposed to the overhang in fig. 2, need not detain us. The variation is only 0.365 foot (7.82—7.455), or 4¼ inches.

The mean rise of the ceiling in the next half spiral turn from fig. 2, G, eighty-sixth step, to fig. 2, I (118th step), on the side of the overhang, is 8.345 — 7.82 = 0.525, or 6 inches. This rise is doubtless a feature of the original prearranged plan, as found on the corresponding overhanging side lower down. The entire system of variation in the height of the stairway, as so far developed, was, however, abandoned at the third gallery platform and the diminution of the amount of rise in the last half spiral turn, as compared with the larger measures lower down, is certainly significant of the approaching abandonment of the system.

Change of Builders at the Fourth Storey, see fig. 2.

The accounts of Mothes, who is the best authority in such matters, make it possible that Bonanno, the first architect of the tower, was absent in Monreale, near Palermo, during the construction of the next storey (third gallery). At all events it is certain that the construction came to a halt in 1186 until 1233, after the fourth storey (third gallery) was finished. The period of inactivity had then lasted about 50 years.

Beyond the third gallery platform (fig. 3, E, D, C, B, A) the mean height of the stairway rises very abruptly from 8 feet at the 120th step, next the platform E, D, C, B, A, to 9.625 feet at the 133rd step. The mean height then decreases to 8.50 feet at the 148th step, next the fourth gallery platform.

We may assume that the increase in the height of the stairway on the west side was originally intended to be continuous throughout the remainder of the construction and that it was intended to diminish the weight of the wall in the upper storeys. Several other effective expedients were undoubtedly employed to that end, especially the successive reductions in the thickness of the tubular wall, to be presently mentioned. These reductions in the thickness of the wall probably made the continuance of the high stairway inadvisable, as the main upper weight of the tower had to be supported by these narrow walls which enclose it. The thickness is only about 2 feet 3 inches in this storey.

Whether the expedient was abandoned by its original devisers or by builders who followed them at a later date, of course, cannot be determined. The temporary revival of the dip system in connection with the rise of the ceiling in the quarter turn on the overhanging side, from the 120th to the 132nd step, between I and F, fig. 3, speaks for itself in the measures. This was certainly suggested by considerations relating to the danger of an outward movement of the high wall of the stairway and in view of its diminished thickness.

It is also extremely significant that, when the fourth gallery platform was reached, the stairway was lowered an entire foot as between the steps on either side of the platform (8.50 feet, 148th step, lower side; 7.41 feet, 150th step, upper side). Such an abrupt change of height is otherwise wholly

* An article in *The American Architect* of November 23, entitled "Brooklyn Museum Measurements of 1910 in the Spiral Stairway of the Leaning Tower of Pisa," contributed by Mr. Wm. H. Goodyear, M.A., Curator of the Department of Fine Arts, Museum of the Brooklyn Institute; hon. member Society of Architects of Rome; hon. member Edinburgh Architectural Association; hon. member Royal Academy of Fine Arts of Milan; hon. academician Royal Academy of Venice; corresponding member American Institute of Architects.

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foreign to the system of the stairway. A new architect, Benenato, took charge of the construction above the fourth gallery platform in 1233, and this lowering the height of the stairway by 1 foot (1.09) was therefore due to him.*

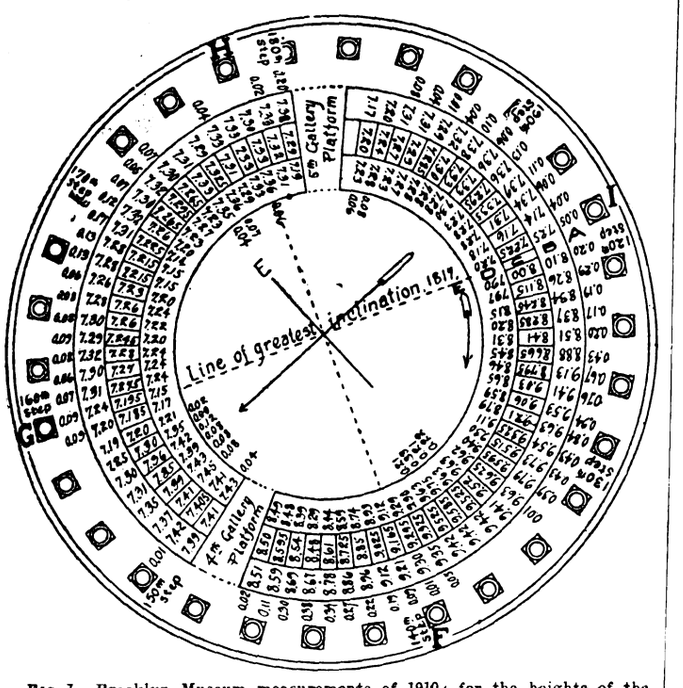


FIG 3.—Brooklyn Museum measurements of 1910; for the heights of the spiral stairway between the third gallery platform at E, D, C, B, A and the 195th step between the fifth and sixth gallery platforms. The circles A, B, C, D, E correspond to those described in the preceding diagram, fig. 2. Measures in feet and decimals.

Beyond this point the measures have been already analysed, and it was from these measures, for the stairway of the fifth and sixth galleries, that we were able to determine the extreme limit of builders' and surveyor's errors for the lower storeys of the tower. There is no further significant change in the height of the stairway, and this applies also to the twenty-two steps beyond the limit of fig. 3.

Exterior Rectification of the Overhang.

Exactly at the point where the system followed in the three lower storeys of the stairway was finally abandoned the exterior rectifications increase. The interior system of alternate rise and fall in the height of the stairway, and the relations of this rise and fall to the overhang, are abandoned at the third gallery platform (fig. 2, I; fig. 3, E, D, C, B, A). The exterior rectifications so far had been 3 cm. in the first gallery and 4 cm. in the second gallery, but they increase to 7 cm. in the third gallery, 15 cm. in the fourth gallery, 8 cm. in the fifth gallery, 11 cm. in the sixth gallery, and 38 cm. between the cornice of the sixth gallery (or seventh storey) and the platform of the eighth storey.

The question may, therefore, be fairly asked: If these rectifications represent efforts to correct a series of settlements of corresponding amount, why were the corresponding efforts to weight the tower more heavily in the spiral stairway on the side opposed to the overhang, and to reduce its weight on the overhanging side, abandoned above the third gallery platform?

The only possible answer is that neither device was intended to correct a settlement. Both devices were intended to contribute to the stability of an intentionally inclined tower, and when that stability was found to be assured the troublesome variations in the height of the stairway were abandoned and the system of exterior rectification was the only one which was continued.

The Eighth Storey.

If the measures of De Fleury for the height of the eighth storey, above the platform, be examined, it will be found that its upper north side is 16 cm. higher than the south side.† Cresy and Taylor even made the north side 11 inches higher than the south side (see *Architect*, October 7, p. 237). Thus, as De Fleury's original section shows, the platform of the eighth storey even has an extra step on the south side and is raised on the south side 38 cm. more than on the north side, whereas the top of the same storey tilts down an extra 16 cm. in the overhanging direction.

On the theory of intentional construction this is an interesting point. Having rectified the inclination of the tower to the total amount of m. 0.30, or 1 foot (see article of October 7), the builders gave a rake to the top of the eighth storey which tends to conceal the final rectification and adds to the effect, but not to the danger, of the lean.

The explanation of Mothes in the passage already mentioned is rather a laboured one. He holds that when the eighth storey platform was built the architect found a settlement, following the others which had previously been rectified, of 22 cm., and that he gave the platform a total extra elevation of 38 cm. on the south side, thus tilting it down 16 *cm. to the north*, in order to counteract the anticipated farther settlement to the south, before it took place. Then, the theory continues, as the anticipated settlement was only 2 cm., the south wall of the bell chamber was made 14 cm. lower* in order to bring it to a level. Then, according to this theory, after the tower was completely finished the additional 70 cm. of settlement took place.

The Theory of Accident Re-examined.

It is a notable point about the utterances of many partisans of the settlement theory that they have spoken rather contemptuously of the opposed opinion. They ought to have remembered, in the past, that a balance of probabilities was at stake, and that much improbability attached to their own theory.

There was the improbability that a tower which went down 8 feet on one side and 13 feet on the other side should have leaned so far without going over entirely, and that it should afterwards have come to rest in a solid and robust condition for so many centuries.

There was the further improbability that masons would have risked their lives on a constantly sinking building, or that architects would have gambled on the chances of the ultimate arrest of the settlement, which must have seemed most improbable then, as it is admitted to be most wonderful now, by the advocates of the settlement theory.

Amico Ricci, who is the standard Italian authority on Italian mediæval architecture,† was a sturdy advocate of the theory of intentional leaning construction in the tower at Pisa, as related to, and suggested by, the leaning towers of Bologna. Besides many conclusive arguments relating to the construction of the leaning towers of Bologna, he advances another which may be applied with even greater force to Pisa. He quotes the laws of the Italian communes, which compelled the owners of dilapidated or accidentally leaning towers to take them down because they were a danger to the public safety. Ricci appeals to these laws as proving that the towers at Bologna must have been known as intentional constructions. Otherwise, he says, the owners would have been compelled by the laws to take them down.

This argument certainly suggests a grave doubt whether the architects of the Pisa tower would have been allowed by the communal authorities to continue it under the frightfully dangerous conditions which the settlement theory presupposes, even if the architects had been the foolhardy men which this theory presumes them to have been.

Conclusion.

The improbabilities which, it must be admitted, always attached to the settlement theory appear to have reached their climax with the revelations of the present article. If the tower leaned only 3 cm. when the first storey was approaching completion, how could the builders have known in what direction the tower was ultimately going to lean before they reached the thirteenth step?

It may now be remembered how many features of the Pisa Campanile appear to harmonise with the desirable conditions of a carefully thought out plan for the construction of a leaning tower whose centre of gravity should fall within the limits of its foundation and whose safety would thus be thoroughly insured. That the upper storeys have galleries of light arcades, resting on a robust and much heavier lower storey, is apparent at the first glance.

Not only do the arcades of the upper storeys represent the mission of diminishing the wall mass without losing the effect of the lower outer diameter, but the same idea is apparent in the construction of the tower in the form of a

* The fifth gallery (sixth storey) was not begun until 1260. This and the sixth gallery (seventh storey) were built by Wilhelm von Innsbruck. The bell chamber, by Tomasso da Pisa, was not built until about 1350.

† See the original *Monuments de Pise*, pl. xxiv. These measures are M. 7 41, north side, and M. 7.25, south side.

* Mothes makes the south side 7.27 instead of 7.25, as found in De Fleury's section, from which he took his argument.

† *Storia dell' Architettura in Italia*, vol. i. pp. 577-84.

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cylinder, with a central void of over 25 feet diameter above the first storey. One could not imagine a more ideal combination of the greatest amount of strength, both real and apparent, with the least amount of masonry weight. The thickness of the wall is also diminished by an increase in the diameter of the interior well amounting to 16 inches.

How the walls diminish in thickness is shown by the following measures:

1st storey (including the engaged columns).	15 ft.	1¼ in.
2nd storey	8 ft.	11½ in.
3rd storey	8 ft.	6¾ in.
4th storey	8 ft.	2 in.

There is also something to be said as regards the well in which the tower stands, which is supposed by the advocates of the accident theory to indicate a downward settlement of an amount otherwise wholly unheard of in the case of any similar building.* Given the idea of building an arcaded leaning tower, with engaged columns on the lower and more robust story, and it would have been clearly impossible to begin such a building on a level surface. If the engaged columns were to have equal height, the base must slope, and if the base were built to slope, that slope should, from an artistic point of view, be placed below the surface level. The well is an indispensable feature in the present beauty of the tower, "the lily leaning in the wind," as Edward Hutton styles it.

The Priority of Grassi's Observations.

Although the bending of the tower towards the perpendicular was supposed by Vasari and by Cresy and Taylor, as it still is supposed by many contributors to the recent literature of the subject, to begin above the fourth storey, it was already known to Ranieri Grassi that the bend towards the perpendicular is found in every storey above the first. He quotes this fact as significant for a purposed inclination, which was intended to impress the spectator as being greater than it really is, and which, at the same time, was carefully constructed for permanent stability. The downward slope to the south of the summit of the bell chamber, when contrasted with the uplift of the platform of the same storey on the same side, is also very significant.

Grassi was also the first to mention the inward dip of the ceiling on the side of the overhang below the first gallery platform, and he was the first to mention the increase in the height of the stairway between the thirteenth and the forty-ninth step.† In these and in many other particulars his observations deserve the highest credit, in spite of the deficiency of measures which he only offers in one not very important instance.

Be it noted also that the "line of greatest inclination," as marked on the diagrams, does not follow the line of Cresy and Taylor's ground plan. As regards both the thirteenth and forty-ninth step, they not only correspond to my own recent observations, but also with those of Grassi. I believe the southern point of inclination to have been correctly fixed by Cresy and Taylor, but as regards the northern point I agree with Grassi, who was probably right in the early part of the nineteenth century, if I am right now.‡

The Pisa Commission believes that the line of greatest inclination has shifted since Cresy and Taylor's publication. This may be doubted, since their line of greatest inclination strikes the ninth step on the north side opposed to the overhang. It probably ought to strike the thirteenth step.

* There are many leaning towers, but no other one can be mentioned which has settled downward with even remote approximation to the figures for direct settlement which must be quoted here.

† My own earlier measurements in the spiral stairway were made at 6 steps instead of 217. These new measures naturally supplant the former. The former measures test very satisfactorily beside the present ones, when compared *at the same steps*, but the choice of the step on the line of greatest inclination was assisted during the present observations by a compass and by careful use of a short plumb line. The only error which I have been able to find in the former observations is an over-estimate of the dip at the forty-sixth step. This over-estimate was probably due to unequal placing of the surveyor's rod on opposite sides of the same step.

‡ Grassi fixes the points of greatest inclination as ten steps below the first gallery platforms and twelve steps above the ground floor: *Descrizione di Pisa e Suoi Contorni*, vol. ii., pp. 101, 102 (1837).

Mr. Charles W. Brooks, F.S.I., A.R.I.B.A., quantity surveyor, has moved to more commodious offices at Vernon House, Sicilian Avenue, Bloomsbury Square, W.C. His telephone number will be Gerard 9052.

VARIETIES.

Mr. William Baillie, architect, Glasgow, has prepared plans for a hall to be erected at Kirkintilloch, N.B., in connection with St. David's United Free Church, at a cost of 1,000*l.* The plans have been passed by the Dean of Guild Court.

H.M. Trade Commissioner for New Zealand reports that a Bill has been introduced into the New Zealand Legislature providing for an expenditure this year of 500,000*l.* in the development by State enterprise of the chief sources of water-power in the Dominion, which the Government intend to retain in their own hands. It is proposed, further, to electrify the railway through the Lyttelton-Christchurch tunnel.

Messrs. Wm. Potts & Sons, Ltd., Leeds and Newcastle-on-Tyne, have erected a clock with illuminated dial and Cambridge quarter chimes at the Carnforth Parish Church, Lancashire. They have also just finished a hour-striking clock with outside dial at Sledmere, East Yorks, for Sir Tatton Sykes, Bart.; one at Stainland, Halifax, West Yorkshire, for Messrs. Benjamin Taylor & Sons; and one for Mr. Allan, Chapel Lane, Bingley, Yorks.

The Llandudno Urban District Council have applied for authority to raise a loan of 21,000*l.* in connection with a scheme, prepared by Mr. E. P. Stephenson, the surveyor, for the completion of the surface water outfall works and the extension of the main sewer to the Craig-y-don district. A Local Government Board inquiry was held last week.

The Hexham Rural District Council invite duly qualified civil engineers to submit schemes, before February 28, for the sewerage and sewage disposal of Corbridge, and offer premiums of 15*l.* and 10*l.* All schemes must comply with the requirements of the Local Government Board, and on payment of premium those selected shall become the absolute property of the Council. In the event of any selected scheme being carried out by the engineer submitting the same, the premium paid shall be taken as on account of the commission of 5 per cent.

REGULATIONS FOR CONCRETE CONSTRUCTION.

The Council of the Royal Institute having received a request from the London County Council to consider and report on their Draft Regulations for Reinforced Concrete Construction, formed the opinion that it would be most desirable to discuss the question of these Draft Regulations with representatives of the various bodies chiefly concerned with the subject to whom the London County Council had sent copies and requests for reports. The Council accordingly invited these bodies to join in a conference to discuss the matter, and the following representatives were appointed:—

Royal Institute of British Architects.—Edwin T. Hall, V.-P. R.I.B.A., chairman; Wm. Dunn (F.), H. D. Searles-Wood (F.), hon. secretary.

Institute of Builders.—F. Higgs, G. B. Godson.

London Master Builders' Association.—Thomas Holloway, William King, Frank May, J.P.

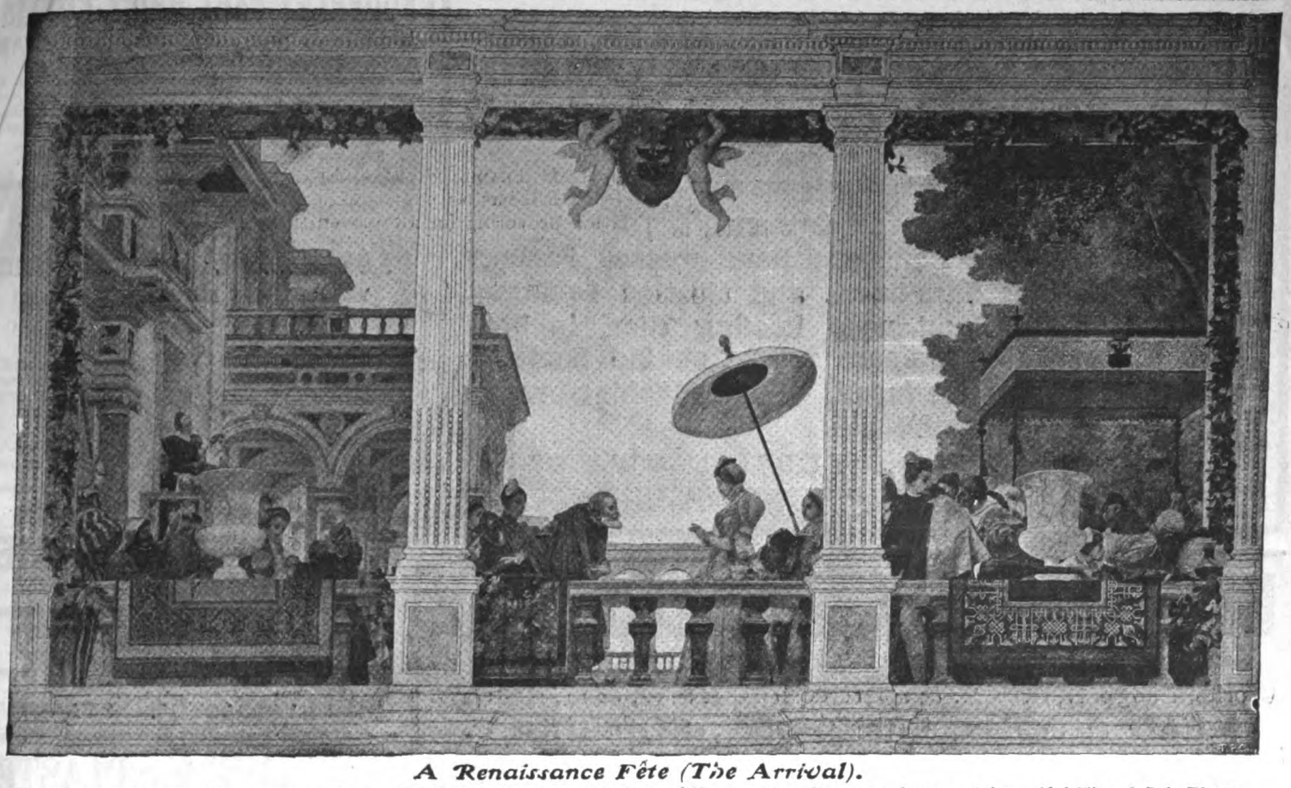
Concrete Institute.—Charles Marsh, T. B. Shore.

Surveyors' Institution.—Sir Alex. Stenning (F.), past president Surveyors' Institute; Howard Chatfeild Clarke (F.), F.S.I., E. B. I'Anson (F.), F.S.I., Percival Currey (F.), F.S.I.

District Surveyors' Association.—Bernard Dicksee (A.), Ed. Dru Drury (F.), F.S.I., Wilfred Hardcastle (A.), F. A. Perkins.

The conference held four meetings and discussed the Draft Regulations in detail, and certain observations were made and amendments suggested and set out in a report which was forwarded to the London County Council. In forwarding this report it was pointed out that the report of the Joint Committee on Reinforced Concrete issued by the Royal Institute of British Architects required revision owing to the progress of knowledge and experience, and that the Reinforced Concrete Committee is again sitting to consider what alterations are desirable. The conference was of opinion that it would be best still to use the methods of calculation given in the report of the Royal Institute of British Architects on Reinforced Concrete, or subsequent reports made by the same body, and not to introduce formulæ into regulations which would tend to stereotype these particular formulæ and hinder the development of new modes of construction.

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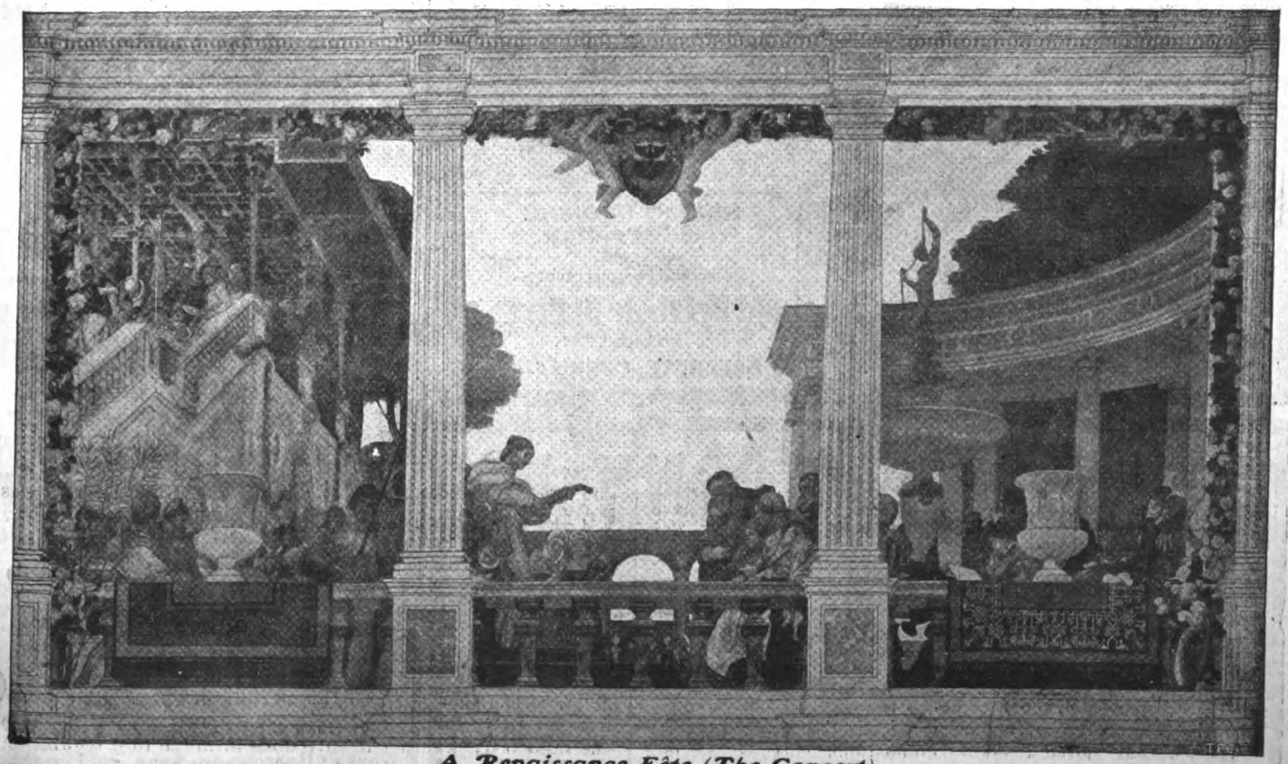
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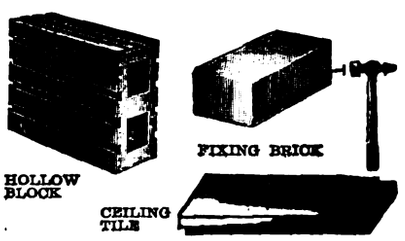
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